SHARP SERVICE MANUAL

S6417R7H55PHR

CONVECTION

MICROWAVE OVEN

MODEL R-7H55

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

SERVICE MANUAL

SHARP

CONVECTION
MICROWAVE OVEN

R-7H55

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION
MICROWAVE RADIATION

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

PRODUCT SPECIFICATIONS
APPEARANCE VIEW
OPERATING SEQUENCE
FUNCTION OF IMPORTANT COMPONENTS
SERVICING AND TROUBLESHOOTING CHART
TEST PROCEDURE
TOUCH CONTROL PANEL ASSEMBLY
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE
MICROWAVE MEASUREMENT
WIRING DIAGRAM
PARTS LIST

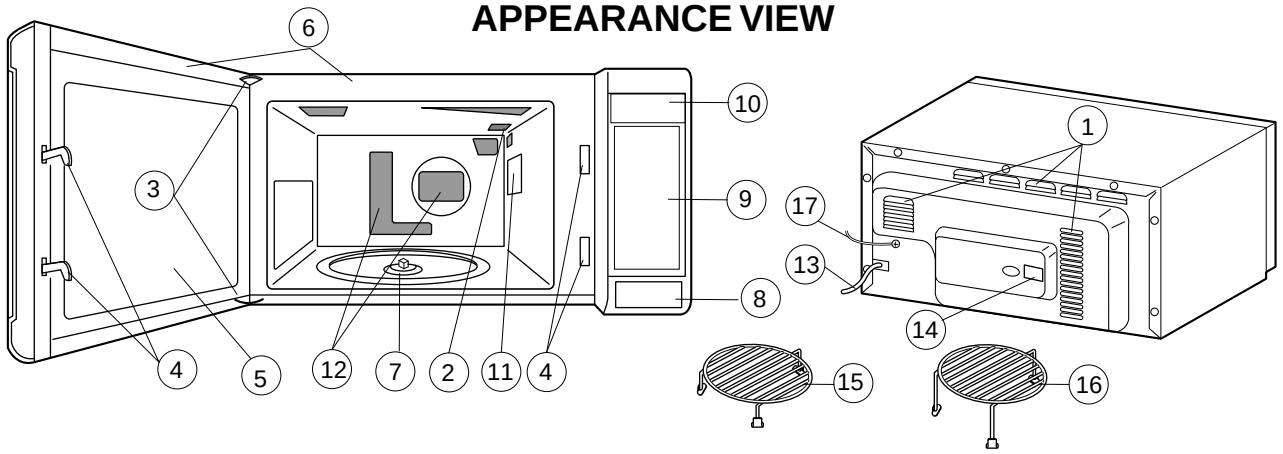
SHARP CORPORATION

OSAKA, JAPAN

PRODUCT SPECIFICATIONS

ITEM	DESCRIPTION
Power Requirements	220 Volts 50 Hertz Single phase
Power Consumption	Microwave 1.4 kW Convection: 1.57 kW
Power Output	850 W nominal of RF microwave energy (IEC 705) Operating frequency 2450 MHz
Convection heating element	1500 W
Case Dimensions	Width 520 mm Height 305 mm Depth 464 mm
Cooking Cavity Dimensions	Width 348 mm Height 204 mm Depth 340 mm
Control Complement	Touch Control System Clock (1:00 - 12:59) Timer (0 - 99 minutes 99 seconds) Microwave Power for Variable Cooking Repetition Rate; HIGH ..... Full power throughout the cooking time MEDIUM HIGH ..... approx. 70% of FULL Power MEDIUM ..... approx. 50% of FULL Power MEDIUM LOW ..... approx. 30% of FULL Power LOW ..... approx. 10% of FULL Power Convection Temperature for Variable Cooking CONVECTION ..... 40 to 250˚C Temp. control LOW MIX ..... 180˚C with 10% of microwave power HIGH MIX ..... 200˚C with 30% of microwave power GRILL ..... 250˚C (Preheat) SENSOR REHEAT pad, SLOW COOK pad SENSOR RICE COOK pad SENSOR STEAM MENU pad EASY DEFROST pad, AUTO COOK pad NUMBER and TEMPERATURE pads MICROWAVE LEVEL pad MORE, LESS pads STOP/CLEAR pad AUTO START/CLOCK pad INSTANT COOK/START pad
Set Weight (Approx.)	22 kg

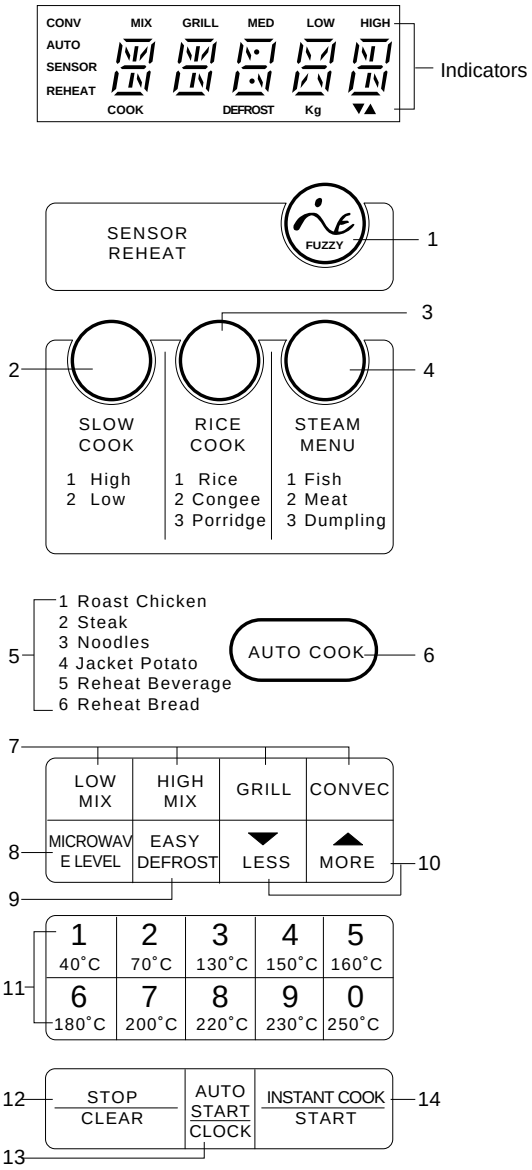
APPEARANCE VIEW



1. Ventilation opening
2. Oven lamp
3. Door hinges
4. Door safety latches
5. See through door
6. Door seals and sealing surfaces
7. Coupling
8. Door open button
9. Touch control panel
10. Digital read-out
11. Wave guide cover
12. Convection air opening
13. Power supply cord
14. Rating label
15. Low lack
16. High lack
17. Earth wire

1. SENSOR REHEAT PAD
   Touch to reheat foods.
2. SLOW COOK PAD
   Touch to cook slowly and longer time.
3. RICE COOK PAD
   Touch to cook rice, congee or porridge.
4. STEAM MENU PAD
   Touch to cook steam menus.
5. AUTO COOK MENUS
6. AUTO COOK PAD
   Touch to select Auto Cook mode.
7. CONVECTION COOKING FUNCTION PADS
   Press to cook for each function.
8. MICROWAVE LEVEL PAD
   Press to select microwave power setting.
   It not pressed, HIGH is automatically selected.
9. EASY DEFROST PAD
   Press to defrost meat by entering weight..
10. MORE (▲), LESS (▼) PADS
    Press to increase / decrease the time in one minute increments during cooking or to alter the doneness for the Multi Cook, Instant Action or Easy Defrost modes.
11. NUMBER AND TEMPERATURE PADS
    Press to enter cooking times, clock time, convection temperature or to select the Auto Cook menus.
12. STOP / CLEAR PAD
    Press to clear during programming.
    Press once to stop operation of oven during cooking: press twice to cancel cooking programme.
13. AUTO START / CLOCK PAD
    Press to select clock or Auto Start time.
14. INSTANT COOK / START PAD
    Press once to cook for 1 minute at HIGH or increase by 1 minute multiples each time this pad is pressed during cooking condition.
    Press to start oven after setting programmes.

TOUCH CONTROL PANEL



OPERATING SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st latch switch, 2nd latch switch and stop switch).

IMPORTANT

When the oven door is closed, the monitor switch contacts COM-NC must be open.

When the microwave oven is plugged in a wall outlet, rated voltage is supplied to the point A1+A3 in the control unit.

Figure O-1 on page 33

1. The display flashes “88:88”.
2. To set any programmes or set the clock, you must first touch the STOP/CLEAR key.
3. “ : “ appears in the display and the time counts up every minute.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the touching NUMBER key and start the oven with touching START key.

Function sequence Figure O-2 on page 33

CONNECTED COMPONENTS	RELAY
Oven lamp, Turntable motor (Power transformer)	RY1
Power transformer	RY2
Fan motor	RY4

1. Rated voltage is supplied to the primary winding of the power transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays (RY1+RY2+RY4) go back to their home position. The circuits to the oven lamp, power transformer, fan motor and turntable motor are cut off.
5. When the door is opened during a cook cycle, the switches come to the following condition.

		Condition	
Switch	Contact	During Cooking	Oven Door Open(No cooking)
1st Latch Switch	COM-NO	Closed	Open
Monitor Switch	COM-NC	Open	Closed
2nd Latch Switch	COM-NO	Closed	Open
Stop Switch	COM-NO	Closed	Open

The circuits to the power transformer and turntable motor are cut off when the 1st latch switch and 2nd latch switch are made open. The fan motor is cut off when the stop switch is made open.

The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay (RY1) stays closed. Shown in the display is the remaining time.

6. MONITOR SWITCH CIRCUIT

The monitor switch is mechanically controlled by oven door, and monitors the operation of the 1st latch switch and 2nd latch switch.

6-1 When the oven door is opened during or after the cycle of a cooking program, the contacts (COM-NC) of the monitor switch must be closed and the contacts (COM-NO) of the 1st latch switch, 2nd latch switch and stop switch must be opened at the same time.

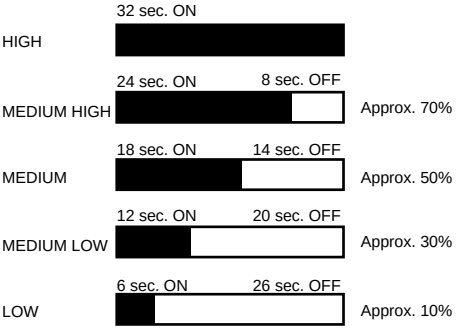
6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch must be opened and the contacts (COM-NO) of the 1st latch switch, 2nd latch switch and stop switch must be closed at the same time.

6-3. When the oven door is opened and the contacts (COM-NO) of the 1st latch switch and the 2nd latch switch remain closed and relay RY2 closes, the fuse M8A will blow, because the contacts (COM-NC) of the monitor switch and relay RY1 are closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, rated voltage is supplied to the power transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.

SETTING



NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

CONVECTION COOKING CONDITION

PREHEATING CONDITION

Program desired convection temperature by touching the CONVECTION pad and the temp. pad. When the START pad is touched, the following operations occur:

1. The coil of shut-off relays RY1+RY5+RY4 are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.

2. The coil of relay (RY6) is energized by the CPU unit. The damper is moved to the closed position, opening the damper switch contacts. The opening of the damper switch contacts sends a signal to the LSI on the CPU unit de-energizing the relay (RY6) and opening the circuit to the damper motor.
3. The coil of heater relay (RY3) is energized by the CPU unit and the main supply voltage is added to the convection heater.
4. When the oven temperature reaches the selected preheat temperature, the following operations occur:

4-1. The heater relay (RY3) is de-energized by the CPU unit temperature circuit and thermistor, opening the circuit to the convection heater.

4-2. The oven will continue to function for 30 minutes, turning the convection heater on and off, as needed to maintain the selected preheat temperature. The oven will shut-down completely after 30 minutes.

CONVECTION COOKING CONDITION

When the preheat temperature is reached, a beep signal will sound indicating that the holding temperature has been reached in the oven cavity. Open the door and place the food to be cooked in the oven. Program desired cooking time and convection temperature by touching the number pad, CONVECTION pad and Temperature pad. When the START pad is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, turntable motor, cooling fan motor and convection motor are energized.
3. Heater relay (RY3) is energized (if the cavity temperature is lower than the selected temperature) and the main supply voltage is applied to the convection heater to return to the selected cooking temperature.
4. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and convection motor are de-energized. At the end of the convection cycle, if the cavity air temperature is above 118˚C, the circuit to (RY4) will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 118˚C, at which time the relay will be de-energized, turning off the fan motor. Relay (RY5) will however, open as soon as the convection cycle has ended, turning off the convection fan motor. This will now cool and allow the damper door to open.
5. At the end of the convection cook cycle, shut-off relay (RY6) is energized turning on the damper motor. The damper is returned to the open position, closing the damper switch contacts which send a signal to the control unit, de-energizing shut-off relay (RY6).

MIX COOKING CONDITION

Program desired cooking time and the LOW MIX or HIGH MIX and temperature. When the START pad is touched, the following operations occur:

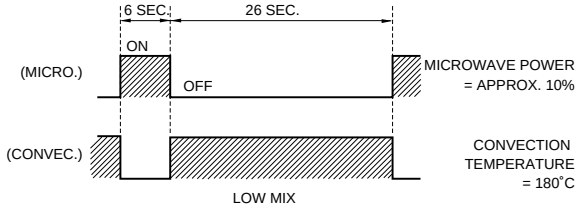
1. The numbers of the digital readout start the count down to zero.
2. The shut-off relay (RY1+RY5+RY4) energized, turning on the oven lamp, turntable motor, cooling fan motor and convection motor.
3. The shut-off relay (RY6) is energized.
   The damper door is closed from the open position.
4. The heater relay (RY3) is energized, adding the mains supply voltage to the convection heater.
5. Now, the oven is in the convection cooking condition.
6. When the oven temperature reaches the selected temperature, the following operations occur:

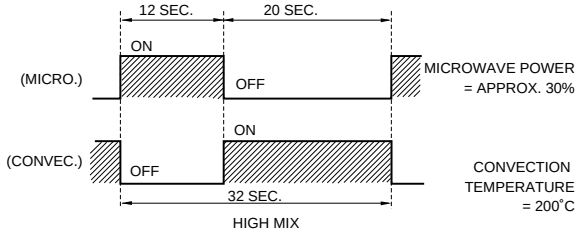
6-1. The power supply voltage is added to the convection heater and power transformer alternately.

6-2. The convection heater operates through the heater relay (RY3) contacts and the power transformer operates through the cook relay (RY2) contacts.

6-3. These are operated by the CPU unit to supply alternately within a 32 second time base, convection heat and microwave energy.
   The relationship between the convection and microwave power operations are as follows.

Note: The ON and OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.





Note: During alternate Microwave/Convection operation, the convection heater is energized only if the cavity temperature drops below the set temperature.

EASY DEFROST COOKING

The EASY DEFROST key is a special function key to defrost meats and poultry faster and better. EASY DEFROST automatically defrosts roast beef, etc.. When the EASY DEFROST is selected and the food weight is entered by using the number pads, the oven will cook according to the special cooking sequence.

AUTO COOK CONDITION

AUTO COOK will automatically compute the oven temperature, microwave power and cooking time for baking, roasting and broiling. It is based on specific foods and the quantity or weight of the food. Program the AUTO COOK mode by touching the AUTO COOK pad and Number pads, enter the weight of the food by touching the Number pads. When the START pad is touched, the oven will generate the microwave energy and/or convection heater energy according to the programmed special cooking sequence.

SENSOR COOKING CONDITION

Using the SENSOR REHEAT, SENSOR RICE COOK or SENSOR STEAM MENU function, the foods are cooked or defrosted without figuring time, power level or quantity. When the oven senses enough steam from the food, it relays the information to its microprocessor which will calculate the remaining cooking time and power level needed for best results.

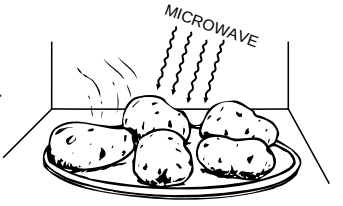
When the food is cooked, water vapor is developed. The sensor "senses" the vapor and its resistance increases gradually. When the resistance reaches the value set according to the menu, supplementary cooking is started.

The time of supplementary cooking is determined by experiment with each food category and inputted into the LSI.

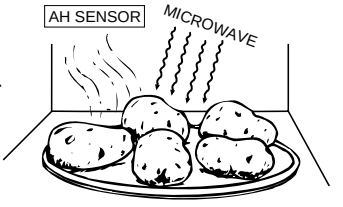
An example of how sensor works: (BAKED POTATOES)

1. Potatoes at room temperature. Vapor is emitted very slowly.

2. Heat potatoes. Moisture and humidity is emitted rapidly. You can smell the aroma as it cooks.



3. Sensor detects moisture and humidity and calculates cooking time and variable power.



Cooking Sequence.

1. Touch SENSOR REHEAT, SENSOR RICE COOK or SENSOR STEAM MENU pad.

NOTE:The oven should not be operated on SENSOR REHEAT, SENSOR RICE COOK or SENSOR STEAM MENU immediately after plugging in the unit. Wait five minutes before cooking on SENSOR REHEAT, SENSOR RICE COOK or SENSOR STEAM MENU.

2. The coils of shut-off relays (RY-1 and RY-4) are energized, the turntable motor, oven lamp and cooling fan motor are turned on, but the power transformer is not turned on.
3. After about 16 seconds, the cook relay (RY-2) is energized. The power transformer is turned on, microwave energy is produced and first stage is started.
   The 16 seconds is the cooling time required to remove any vapor from the oven cavity and sensor.

NOTE: During this first stage, do not open the door or touch STOP/CLEAR pad.

4. When the sensor detects the vapor emitted from the food, the display switches over to the remaining cooking time and the timer counts down to zero.
   At this time, the door may be opened to stir food, turn it or season, etc.
5. When the timer reaches zero, an audible signal sounds.
   The shut-off relays and cook relay are de-energized and the power transformer, oven lamp, etc. are turned off.
6. Opening the door or touching the STOP/CLEAR pad, the time of day will reappear on the display and the oven will revert to an OFF condition.

FIRE SENSING FEATURE (MICROWAVE MODE)

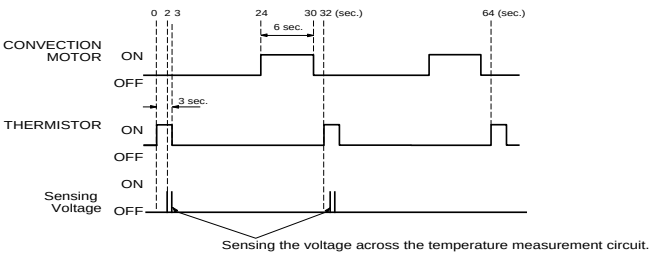
This model incorporates a sensing feature which will stop the oven's operation if there is a fire in the oven cavity during microwave cooking.

This accomplished by the LSI repeatedly measures the voltage across the temperature measurement circuit (thermistor) during it's 32-seconds time base comparing the obtained voltage measurements. If the most recent voltage measured is 300mV grater than the previous voltage measured, the LSI judges it as a fire in the oven cavity and switches off the relays to the power transformer, fan motor and convection motor. The LSI also stops counting down and closes the damper door so that no fresh air will enter the oven cavity. Please refer to the following section for a more detailed description.

Operation

Please refer to the timing diagrams below.

1. The thermistor operates within a 32-seconds time base and it is energized for three (3) seconds and off for 29 seconds. Two (2) seconds after the thermistor is energized, the voltage across the temperature measurement circuit is sampled by the LSI and twenty one (21) seconds after the thermistor is cut off the LSI turns on the cooling fan for six (6) seconds.
2. The above procedure is repeated. If the difference between the first voltage measured (in step 1) and the voltage measured when the procedure is repeated (step 2) is greater than 300mV the LSI makes the judgment that there is a fire in the oven cavity and will switch off the relays to the power transformer, fan motor and convection motor. The LSI also stops counting down and closes the damper door so that no fresh air will enter the oven cavity.
3. Once the fire sensor feature has shut the unit down, the programmed cooking cycle may be resumed by pressing the "START" pad or the unit may be reset by pressing the "CLEAR" pad.



Sensing the voltage across the temperature measurement circuit.

IMPORTANT:

During sensor cooking operation, the fire sensing operation sequence will not begin until the AH sensor has detected vapours and initiated a sensor cooking cycle. This is because the operation of the convection fan would interfere with the AH sensor's vapour detection.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1.
When the open button is pushed, the open button pushes up the switch lever, and then the switch lever pushes up the latch head. The latch heads are moved upward and released from latch hook. Now the door will open.

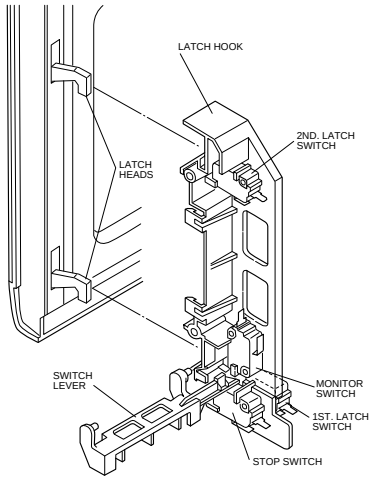


Figure D-1. Door Open Mechanism

1ST. LATCH SWITCH, 2ND. LATCH SWITCH AND STOP SWITCH

1. When the oven door is closed, the contacts COM-NO) must be closed.
2. When the oven door is opened, the contacts .(COM-NO) must be opened.

MONITOR SWITCH

1. When the oven door is closed, the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NC) must be closed.
3. If the oven door is opened and the contacts (COM-NO) of the 1st. latch switch, 2nd. latch switch and relay RY2 fail to open, the fuse M8A blows simultaneously with closing the contacts (COM-NC) of the monitor switch.

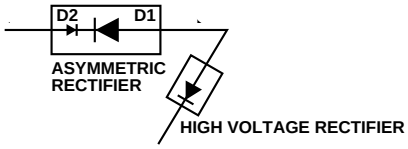
CAUTION: BEFORE REPLACING A BLOWN FUSE M8A TEST THE 1ST. LATCH SWITCH, 2ND. LATCH SWITCH MONITOR SWITCH, RELAYS (RY1 AND RY-2) AND MONITOR RESISTOR FOR PROPER OPERATION.

MONITOR RESISTOR R 0.8Ω 20W

The monitor resistor prevents the fuse M8A bursting when the fuse M8A blows due to the operation of the monitor switch.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the power transformer by blowing the fuse M8A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of blowing the fuse M8A.)

1. The high voltage rectifier is shorted by any causes when microwave cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the power transformer.
5. The large electric currents beyond M8A flow through the primary winding of the power transformer.
6. The fuse M8A blows by the large electric currents.
7. The power supply to the all electrical parts are cut off.

FUSE M8A

1. The fuse M8A blows when the contacts (COM-NO) of the 1st. latch switch 2nd. latch switch and relay RY2 remain closed with the oven door open and when the monitor switch closes.
2. The fuse M8A also blows when asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of power transformer is shorted.
3. If the wire harness or electrical components are short-circuited, this fuse M8A blows to prevent an electric shock or fire hazard.

THERMAL CUT-OUT 145˚C (MG)

This thermal cut-out protects the magnetron against overheating. If the temperature goes up higher than 145˚C because the fan motor is interrupted, the ventilation openings are blocked, the thermal cut-out will open and the line voltage to the power transformer will be cut off and the operation of the magnetron will be stopped.
The defective thermal cut-out must be replaced with new one.

THERMAL CUT-OUT 150˚C (CONVECTION)

The thermal cut-out protect the convection motor against over heating. If its temperature of the convection motor rises above 150˚C because the convection fan motor is interrupted, the ventilation openings are obstructed or the other abnormal matter occurs, the thermal cut-out opens and switch of the oven. When thermal cut-out cools itself down to 130˚C, the contacts of the thermal cut-out will close again.

THERMAL CUT-OUT 95˚C (FAN MOTOR)

The thermal cut-out protect the fan motor against overheating. If its temperature goes up higher than 95˚C because the fan motor is locked or the ventilation operating are blocked, the contacts of the thermal cut-out will open and switch off the oven. When the oven cools itself down to 75˚C, the contacts of the thermal cut-out will close again.

THERMISTOR

The thermistor is a negative temperature coefficient type. The temperature in the oven cavity is detected through the resistance of the thermistor, and then the control unit cause the heating element relay to operate, thus the current to the heating element is turned ON/OFF.

TURNTABLE MOTOR

The turntable motor drives the turntable roller assembly to rotate the turntable.

CONVECTION MOTOR

The convection motor drives the convection fan and provides the heated air.

FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity

HEATING ELEMENT

The heating element is located at the rear side of the oven cavity. It is intended to heat air driven by the convection fan. The heated air is kept in the oven and force-circulated and reheated by the heating element.

CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is not directly heated by the heating element, but is heated by forced circulation of the hot air produced by the heating element.
The air heated by the heating element is circulated through the convection passage provided on the outer casing of the oven cavity by means of the convection fan which is driven by the convection motor. It then enters the inside of the oven through the vent holes provided on the rear side of the oven. Next, the hot air heats the food on the turntable and leaves the oven cavity through the vent in the center of the oven cavity rear side wall.
Without leaving the oven, this hot air is reheated by the heating element, passes through the convection passage and enters the inside of the oven cavity again, in a continuing cycle.
In this way, the hot air circulates inside the oven cavity to raise its temperature and, at the same time, comes into contact with the food being cooked.
When the temperature inside the oven cavity reaches the selected temperature, the heating element is de-energized. When the temperature inside the oven cavity drops below the selected temperature, the heating element is energized again. In this way, the inside of the oven cavity is maintained at approximately the selected temperature.
When the convection time reaches 0, the heating element is de-energized and the convection fan stops operating and the oven shuts off.

DAMPER OPEN-CLOSE MECHANISM

Usually, the damper is in the open position except during convection cooking.
Damper position is set automatically by damper motor, damper switch, damper cam and damper shaft.
These components are operated by a signal that judges if microwave cooking or convection cooking operation is selected by the control unit.

Microwave Cooking:

Damper is in the open position, because a portion of cooling air is channeled through the cavity to remove steam and vapors given off from the heating foods
It is then exhausted at the top of the oven cavity into a condensation compartment.

Convection Cooking:

Damper is in the closed position, so that no hot air will be allowed to leak out the oven cavity.

Damper Operation

1-1. When power supply cord is plugged in, a signal is sensed in the control unit, and operates shut-off relay (RY6).

1-2. Contacts of shut-off relay (RY6) close, the damper motor is energized, opening the damper door.

1-3. When the damper is moved to the open position by the damper cam the damper switch is closed (ON position).

1-4. The signal of damper switch is re-sensed in the control unit and shut-off relay (RY6) is turned off.

1-5. The A.C.line voltage to the damper motor is removed and the motor turns off.

2. When oven is microwave cooking:
Damper is in the open position.

3. When oven is convection cooking:

3-1. Damper motor is energized by touching the convection, temperature and START pads.

3-2. When damper is in the closed position (damper switch is OFF), its signal is sensed by the control unit, and shut-off relay (RY6) is de-energized.

3-3. The damper is held in the closed position during the convection cooking operation.

3-4. At the end of the convection cooking, shut-off relay (RY6) is energized, and the damper is returned to the open position.

NOTE: If the damper door is not in the proper position, closed during convection or open during microwave, the control unit will stop oven operation after 1 minute.

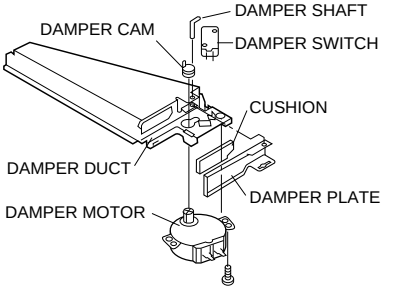


Figure D-2. Damper Mechanism

NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power circuit.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with any part of the high voltage circuit will result in electrocution. High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

1) Disconnect the supply.
2) Door opened, and wedged open.
3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

1) Reconnect all leads removed from components during testing.
2) Replace the outer case (cabinet).
3) Reconnect the supply.
4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the microwave timer for two (2) minutes. Set the power level to HIGH and push the START button. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and microwave leakage test carried out

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure"section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse M8A in the 1st. latch switch - 2nd. latch switch - relay RY1 - relay RY2 - monitor switch - monitor resistor circuit, check the 1st. latch switch, 2nd. latch switch, monitor switch relay RY1, relay RY2 and monitor resistor before replacing the fuse M8A.

CK = Check / RE = Replace

TEST PROCEDURE		A	B	C	D	E	E	E	E	F	G	G	G	H	H	H	I	J
CONDITION	POSSIBLE CAUSE AND DEFECTIVE PARTS / PROBLEM	MAGNETRON	POWER TRANSFORMER	H.V. RECTIFIER ASSEMBLY	HIGH VOLTAGE CAPACITOR	1ST. LATCH SWITCH	2ND. LATCH SWITCH	STOP SWITCH	MONITOR SWITCH	FUSE M8A	THERMAL CUT-OUT 145˚C (MG.)	THERMAL CUT-OUT 95˚C (FAN)	THERMAL CUT-OUT 150˚C (CONV.)	FAN MOTOR	TURNTABLE MOTOR	CONVECTION MOTOR	CONVECTION HEATER	THERMISTOR
OFF CONDITION	Home fuse blows when power supply cord is plugged into wall outlet.																	
	Fuse M8A blows when the door is opened.					○	○		○									
	FUSE M8A blows when power supply cord is plugged into wall outlet.								○									
	"88:88" does not appear in display when power supply cord is first plugged into wall outlet.									○	○	○	○					
	Display does not operate properly when STOP/CLEAR pad is touched. (The time of day should be appear on the display with beep sound during normal condition.)							○										
	Oven lamp does not light at door opened.																	
COOKING CONDITION (COMMON)	Oven lamp does not light at all.																	
	Turntable motor does not operate. (Oven lamp light.)					○									○			
	Cooling fan motor does not operate.													○				
	The oven stops after 1 minute.																	
	Oven does not go into cook cycle, when START pad is touched.							○										
COOKING CONDITION (MICROWAVE)	Low or no power is produced during microwave cooking (The food is heated incompletely or not heated at all)	○	○	○	○		○											
	Extremely uneven heating is produced in oven load (food).														○			
	Function of variable cooking does not operate properly except HIGH power.																	
COOKING CONDITION (CONVECTION)	CONV indicator lights, but heating element does not heat.																○	○
	Temperature in the oven cavity is lower or higher than preset.															○	○	○
	When preheating, the oven does not stop.																	○
	Convection cycle runs 4 minutes and 15 seconds then the oven shuts down.																	○
SENSOR COOKING CONDITION	AH sensor does not end during Sensor Cooking condition.(Oven does not shut off when a cup of water is boiling by Sensor Cooking.)																	
	Oven stops at 16 sec. after starting																	

DAMPER MOTOR																					
DAMPER SWITCH																					
OVEN LAMP OR SOCKET																					
TOUCH CONTROL PANEL																					
KEY UNIT																					
RELAY (RY-1)																					
RELAY (RY-2)																					
RELAY (RY-3)																					
RELAY (RY-4)																					
RELAY (RY-5)																					
RELAY (RY-6)																					
OPENED WIRE HARNESS																					
SHORTED WIRE HARNESS																					
POWER SUPPLY CORD																					
NO POWER AT WALL OUTLETT																					
MONITOR SESISTOR																					
FOIL PATERN ON PWB.																					
OPEN WIRING TO THERMISTOR																					
AH SENSOR ASSEMBLY																					
NOISE FILTER																					
H	E	RE	L	M	N	N	N	N	N	N	CK	RE	RE	CK	K	P	CK	O	Q		

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

A **MAGNETRON TEST**

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECK

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (1 Litre water load)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately P x t/4.187 calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is V x ΔT.

The formula is as follows;

$P \times t / 4.187 = V \times \Delta T$ $P (W) = 4.187 \times V \times \Delta T / t$

Our condition for water load is as follows:

Room temperature.....around 20°C Power supply Voltage.....Rated voltage

Water load.....1000 g Initial temperature.....10±2°C Heating time.....49 sec.

$P = 85 \times \Delta T$

Measuring condition:

1. Container
   The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
   The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
   The initial temperature of the water is (10±2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer.
7. The water load must be (1000±5) g.
8. “t” is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is “t + 2” sec. 2 sec. is magnetron filament heat-up time.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
   (Example: The initial temperature T1 = 11°C)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value Δ T of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.

TEST PROCEDURES

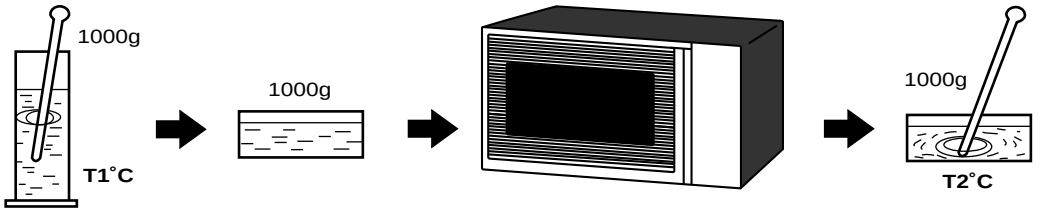
PROCEDURE LETTER	COMPONENT TEST

6. Measure the final water temperature. (Example: The final temperature T2 = 21°C)
7. Calculate the microwave power output P in watts from above formula.

Initial temperature	T1 = 11°C
Temperature after (49 + 2) = 51 sec.	T2 = 21°C
Temperature difference Cold-Warm	ΔT1 = 10°C
Measured output power	
The equation is "P = 85 x ΔT"	P = 85 x 10°C = 850 Watts

JUDGMENT: The measured output power should be at least ± 15 % of the rated output power.

CAUTION: 1°C CORRESPONDS TO 85 WATTS REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



Heat up for 51 sec.

B **POWER TRANSFORMER TEST**

WARNING: High voltages and large currents are present at the secondary winding and filament winding transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS

Disconnect the leads to the primary winding of the power transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:

a. Primary winding ..... approx. 1.2 Ω

b. Secondary winding ..... approx. 92.6 Ω

c. Filament winding ..... less than 1 ohm

If the reading obtained are not stated above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

C **HIGH VOLTAGE RECTIFIER ASSEMBLY TEST**

HIGH VOLTAGE RECTIFIER TEST
CARRY OUT 3D CHECKS.
Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

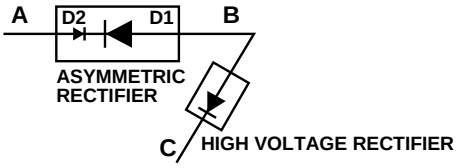
TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

CARRY OUT 4R CHECKS

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power transformer is shorted.

CARRY OUT 4R CHECKS

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS

A. Isolate the high voltage capacitor from the circuit.
B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
D. A short-circuited capacitor shows continuity all the time.
E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS

E SWITCH TEST

CARRY OUT 3D CHECKS

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal,
NO; Normally open terminal
NC; Normally close terminal
S.C.; Short,
O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch or replace the switch.

CARRY OUT 4R CHECKS.

F BLOWN FUSE M8A

CARRY OUT 3D CHECKS

1. If the fuse M8A is blown, there could be shorts or ground in electrical parts or wire harness.

   Check them and replace the defective parts or repair the wire harness.

2. If the fuse M8A is blown when the door is opened, check the 1st. latch switch, 2nd. latch switch, monitor switch, monitor resistor, relay RY1 and relay RY2.

   If the fuse M8A is blown by incorrect door switching replace the defective switch(s) and the fuse M8A.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

3. If the fuse M8A is blown, there could be a short in the asymmetric rectifier or there could be a ground in wire harness. A short in the asymmetric rectifier may have occured due to sh ort or ground in H.V. rectifier, magnetron, power transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

CAUTION: Only replace fuse M8A with the correct value replacement.

G THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the table below.

CARRY OUT 4R CHECKS

Table: Thermal cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit) (˚C)	Temperature of "OFF" condition (open circuit) (˚C)	Indication ofohmmeter (When room temperature is approx. 20˚C)
Thermal cut-out 145˚C	This is not resetable type	Above 145˚C	Closed circuit.
Thermal cut-out 150˚C	Below130˚C	Above 150˚C	Closed circuit.
Thermal cut-out 95˚C	Below 75˚C	Above 95˚C	Closed circuit.

If incorrect readings are obtained, replace the thermal cut-out.

An open circuit thermal cut-out 145˚C (MG) indicates that the magnetron has overheated, this may be due to resistricted ventilation, cooling fan failure or a fault condition within the magnetron or H.V. circuit.

An open circuit thermal cut-out 150˚C (CONV.) indicates that the convection motor has over heated, this may be due to convection motor locked..

An open circuit thermal cut-out 95˚C (FAN) indicates that the fan motor winding has overheated, this may be due to blocked ventilation or locked cooling fan.

H MOTOR WINDING TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the motor.
Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 370 Ω
Turntable motor	Approximately 12 kΩ
Convection fan motor	Approximately 180 Ω
Damper motor	Approximately 11 kΩ

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS

I CONVECTION HEATER TEST

CARRY OUT 3D CHECKS

Before carring out the following tests make sure the heater is fully cool.

1. Resistance of heater
   Disconnect the wire leads to the heater to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heater. The resistance of heater is approximately 32 ohms.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

2. Insulation resistance
   Disconnect the wire leads to the heater to be tested. Check the insulation resistance between the element and cavity using a 500V - 100Mohms insulation tester. The insulation resistance should be more than 10Mohms in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heater is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

J **THERMISTOR TEST**

CARRY OUT 3D CHECKS

Disconnect connector-B from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's B-5 and B-6 of the thermistor harness.

Room Temp. ..... 20˚C - 30˚C
Resistance ..... Approx. 350 kΩ -- 155 kΩ

If the meter does not indicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS

K **MONITOR RESISTOR TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the monitor resist. Using an ohmmeter and set on a low range. Check between the terminals of the monitor resistor.

The resistance of monitor resistor is approx. 0.8 ohms.

If incorrect readings are obtained, replace the monitor resistor.

CARRY OUT 4R CHECKS.

L **TOUCH CONTROL PANEL ASSEMBLY TEST**

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter.
In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and troubleshooting by replacement is described according to the symptoms indicated.

1. Key Unit. Note: Check key unit ribbon connection before replacement.
   The following symptoms indicate a defective key unit. Replace the key unit.
   a) When touching the pads, a certain pad produces no signal at all.
   b) When touching a number pad, two figures or more are displayed.
   c) When touching the pads, sometimes a pad produces no signal.
2. Control Panel
   The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test (Procedure M) to determine if control unit is faulty.

2-1 In connection with pads.
   a) When touching the pads, a certain group of pads do not produce a signal.
   b) When touching the pads, no pads produce a signal.

2-2 In connection with indicators
   a) At a certain digit, all or some segments do not light up.
   b) At a certain digit, brightness is low.
   c) Only one indicator does not light.
   d) The corresponding segments of all digits do not light up; or they continue to light up.
   e) Wrong figure appears.
   f) A certain group of indicators do not light up.
   g) The figure of all digits flicker.

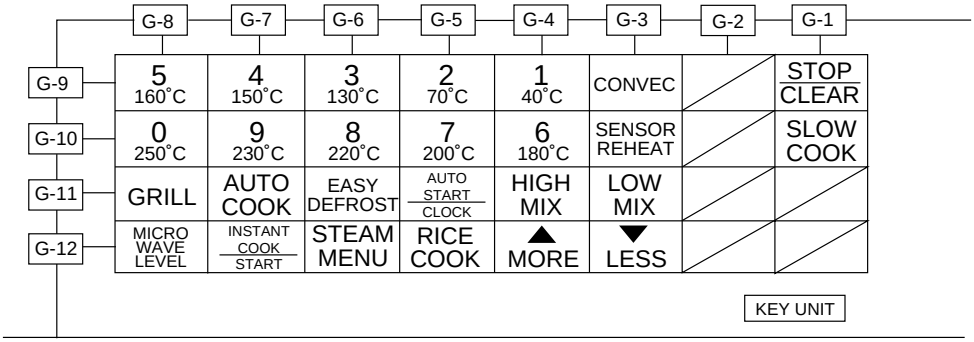
TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

2-3 Other possible problems caused by defective control unit.
a) Buzzer does not sound or continues to sound.
b) Clock does not operate properly.
c) Cooking is not possible.

M **KEY UNIT TEST**

If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the flat ribbon is marking good contact, verify that the door sensing switch(stop switch) operates properly; that is the contacts are closed when the door is closed andopen when the door is open. If the door sensing switch(stop switch) is good, disconnecct the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connecter). Use the Key unit matrix indicated on the control panel schematic and place a jamper wire between the pins that correspond to the STOP/CLEAR pad marking momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.



CARRY OUT 4R CHECKS

N **RELAY TEST**

CARRY OUT 3D CHECKS
Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 9 pin connector (A) on the control unit with an A.C. voltmeter.
The meter should indicat 220 volts, if not check oven circuit.

Relay Test

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, convection cooking operation or grill cooking operation.
DC. voltage indicated..... Defective relay.
DC. voltage not indicated..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 26.0V.D.C.	Oven lamp/Turntable motor
RY2	Approx. 25.5V.D.C.	High voltage transformer
RY3	Approx. 25.0V.D.C.	Convection heating element
RY4	Approx. 26.0V.D.C.	Fan motor
RY5	Approx. 26.0V.D.C.	Convection motor
RY6	Approx. 26.0V.D.C.	Damper motor

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

O **PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN**

To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS

STEPS	OCCURANCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A)	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)

NOTE: At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.

CARRY OUT 4R CHECKS

P **AH SENSOR TEST**

Checking the initial sensor cooking condition

(1) The oven should be plugged in at least five minutes before sensor cooking.
(2) Room temperature should not exceed 95˚F(35˚C).
(3) The unit should not be installed in any area where heat and steam are generated. The unit should not be installed, for example, next to a conventional surface unit. Refer to the "INSTALLATION Instructions" .
(4) Exhaust vents are provided on the back of the unit for proper cooling and air flow in the cavity. To permit adequate ventilation, be sure to install so as not to block these vents. There should be some space for air circulation.
(5) Be sure the exterior of the cooking container and the interior of the oven are dry. Wipe off any moisture with a dry cloth or paper towel.
(6) The Sensor works with food at normal storage temperature.For example, chicken pieces would be at refrigerator temperature and canned soup at room temperature.
(7) Avoid using aerosol sprays or cleaning solvents near the oven while using Sensor settings. The sensor will detect the vapor given of by the spray and turn off before food is properly cooked.
(8) If the sensor has not detected the vapor of the food, ERROR will appear and the oven will shut off.

Water load cooking test

Make sure the oven has been plugged in at least five minutes before checking sensor cook operation. The cabinet should be installed and screws tightened.
(1) Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup.
(2) Place the container on the center of tray in the oven cavity.
(3) Close the door.
(4) Touch SENSOR REHEAT pad. The oven will operate for the first 16 seconds, without generating microwave energy.

NOTE: ERROR will appear if the door is opend or STOP/CLEAR pad is touched during first stage of sensor cooking.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

(5) After approximately 16 seconds, microwave energy is produced, oven should turn off when water is boiling (bubling).

If the oven does not turn off, replace the AH sensor or check the control unit, refer to explanation below.

TESTING METHOD FOR AH SENSOR AND/OR CONTROL UNIT

To determine if the sensor is defective, the simplest method is to replace it with a new replacement sensor.

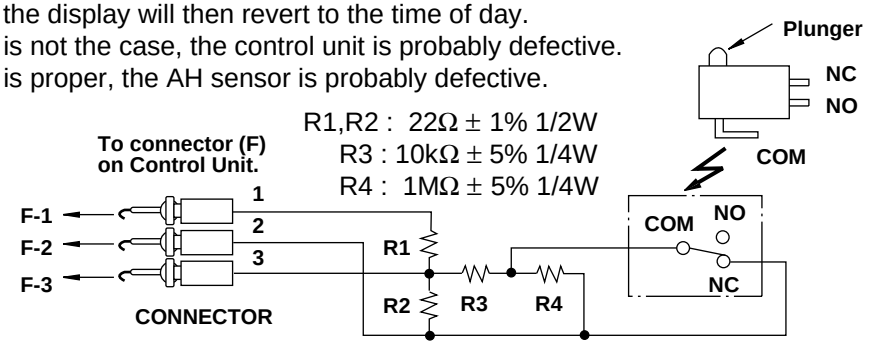
(1) Disconnect oven from power supply and remove outer case.
(2) Discharge the high voltage capacitor.
(3) Remove the AH sensor.
(4) Install the new AH sensor.
(5) Re-install the outer case.
(6) Reconnect the oven to the power supply and check the sensor cook operation proceed as follows:
  6-1. Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup.
  6-2. Place the container on the center of tray in the oven cavity.
  6-3. Close the door.
  6-4. Touch SENSOR REHEAT pad.
  6-5. The oven will turn off automatically when the water is boiling (bubling).

If new sensor dose not operate properly, the problem is with the control unit.

CHECKING CONTROL UNIT

(1) Disconnect oven from power supply and remove outer case.
(2) Discharge the high voltage capacitor.
(3) Disconnect the wire leads from the cook relay.
(4) Disconnect the sensor connector that is mounted to lower portion of control panel.
(5) Then connect the dummy resistor circuit (see fig.) to the sensor connector of control panel.
(6) Reconnect the oven to the power supply and check the sensor cook operation proceed as follows:
  6-1. Touch SENSOR REHEAT pad.
  6-2. The control panel is in the sensor cooking operation.
  6-3. After approximately 20 seconds, push plunger of select switch. This condition is same as judgement by AH sensor.
  6-4. After approximately 3 seconds, cooking operation turns off, an audible signal will sound, and the display will then revert to the time of day.

If the above is not the case, the control unit is probably defective.
If the above is proper, the AH sensor is probably defective.

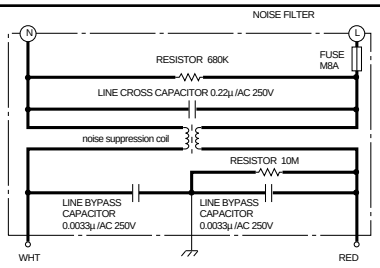


Sensor Dummy Resistor Circuit

Q **NOISE FILTER TEST**

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the noise filter. Using an ohmmeter, check between the terminals as described in the following table.
If incorrect readings are obtained, replace the noise filter unit.



MEASURING POINT	INDICATION OF OHMMETER
Between N and L	Approx. 680 kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

CARRY OUT 4R CHECKS

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOIUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

(1) Key Unit
(2) Control Unit

The principal functions of these units and the signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through R20-R23. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R80-R83, D10 and D12-D13 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, indicator circuit, relay circuit, temperature measurement circuit and AH sensor circuit.

1) LSI

This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit

This circuit generates voltages necessary in the control unit.

Symbol	Voltage	Application
VC	-5.1V	LSI(IC1)
VP	-26V	Fluorescent display tube : Grid and anode voltage
VF1	2.9Vac	Filament of fluorescent display tube
VF2		(VF1 to VF2 voltage)

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL Circuit

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit noticing sounds (key touch sound and completion sound).

6) Door Sensing Switch (Stop Switch)

A switch to “tell” the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, fan motor, turntable motor and light the oven lamp.

8) Indicator Circuit

Indicator element is a Fluorescent Display.

Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode.

The Fluorescent Display has 6-digits, 14-segments are used for displaying figures.

9) Temperature Measurement Circuit

The temperature in the oven cavity is sensed by the thermistor.

The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI.

The result of detecting is given to LSI controlling the relay and display.

10) Damper switch

A switch to tell the LSI if the damper is open or close.

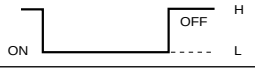
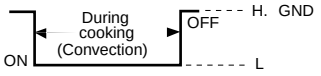
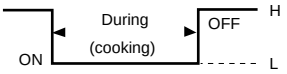
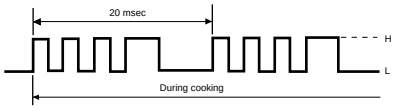
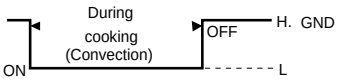
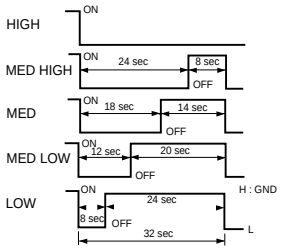
11) AH Sensor Circuit

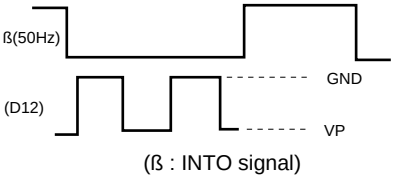
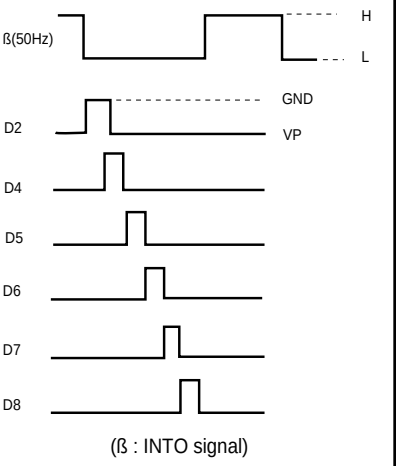
This circuit detects the moisture of a food which is cooking, to allow its automatic cooking.

DESCRIPTION OF LSI

LSI(IZA573DR)

The I/O signal of the LSI(IZA573DR) is detailed in the following table.

Pin No.	Signal	I/O	Description
1	R60	OUT	**Damper motor relay driving signal.** To turn on and off shut-off relay (RY6). 
2	R61	OUT	**Convection motor driving signal.** To turn on and off shut-off relay (RY5). "L" level during CONVECTION; "H" level otherwise. 
3	R62	OUT	**Cooling fan motor driving signal.** To turn on and off shut-off relay (RY4). "L" level during both microwave, convection cooking; "H" level otherwise. 
4	R63	OUT	**Oven lamp and turntable motor driving signal. (Square Waveform : 50Hz)** To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit and relay (RY2,RY3,RY5) control circuit. 
5	R70	OUT	Terminal not used.
6	R71	OUT	**Heating element driving signal.** To turn on and off heater relay (RY3). "L" level during convection cooking; "H" level otherwise. During convection cooking ; the signal becomes "H" level when the temperature of the oven cavity exceeds the predetermined temperature. 
7	R72	OUT	Terminal not used.
8	R00	OUT	**Magnetron High-voltage circuit driving signal.** To turn on and off the cook relay (RY2). In P-HI operation, the signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (MED HIGH, MED,MED LOW,LOW) the signal turns to "H" level and "L" level in repetition according to the power level. 
9	R01	IN	**Input signal which communicates the door open/close information to LSI..** Door closed; "H" level signal. Door opened; "L" level signal.
10	R02	IN	**Input signal which communicates the damper open/close information to LSI.** Damper opened; "H" level; signal (0V:GND). Damper closed; "L" level; signal (-5V:VC).
11	R03	OUT	**Timing signal output terminal for temperature measurement(OVEN).** "H" level (GND) : Temperature measuring timing. (Convection cooking or dual cooking) / "L" level (-5V) : Thermistor OPEN timing.
12	TEST	IN	Connected to VC.
13	RESET	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
14	OSC1	IN	**Internal clock oscillation frequency input setting.** The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to OSC1 terminal.
15	OSC2	OUT	**Internal clock oscillation frequency control output.** Output to control oscillation input of OSC2.
16	GND	IN	Connected to VC.
17/18	X1/X2	IN/OUT	Terminal not used.

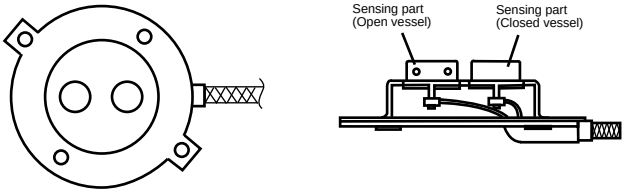
Pin No.	Signal	I/O	Description
19	AVSS	IN	**Reference voltage input terminal.** A reference voltage apllied to the A/D converter in the LSI. T he reference voltage is generally maintaned at -5V.
20	AN0	IN	**Temperature measurement input: OVEN THERMISTOR.** By inputting DC voltage corresponding to the temperature detected by the themistor, this input is converted into temperature by the A/D converter built into the LSI.
21	AN1	IN	**AH sensor input.** This input is an analog input terminal from the AH sensor circuit, and connected to the A/D converter built into the LSI.
22	AN2	IN	Used for initial balancing of the bridge circuit (absolute humidity sensor). This input is an analog input terminal from the AH sensor circuit, and connected to the A/D converter built into the LSI.
23-27	AN3-AN7	OUT	Used for initial balancing of the bridge circuit(absolute humidity sensor)
28	AN8	IN	Connected to GND.
29-31	AN9-AN11	IN	**Heating constant compensation terminal.**
32/33	AVCC/VCC	IN/IN	Connected to GND.
34	INT1	IN	**Signal synchronized with commercial source frequency(50Hz).** This is basic timing for time processing of LSI.
35	D1	OUT	**Segment data signals.** The relation between signals and indicators are as follows: Signal ..... segment Signal ..... segment D1 ..... UB R91 ..... f D9 ..... k R92 ..... g R80 ..... a R93 ..... j R81 ..... b R10 ..... p R82 ..... c R11 ..... h R83 ..... d R12 ..... n R90 ..... e R13 ..... LB  (ß : INTO signal) Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal (ß) period, and input to the anode of the fluorescent display.
36	D2	OUT	**Digit selection signal.** The relationship between digit signal and digit are as follows: Digit signal Digit D2 ..... 1st. D4 ..... 2nd. D5 ..... 3rd. D6 ..... 4th. D7 ..... 5th. D8 ..... 6th.  (ß : INTO signal) Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal (ß) period, and input to the grid of the fluorescent display.
37	D3	OUT	**Signal to sound buzzer.** A: key touch sound(0.12sec.). B: Completion sound(2.4sec.).
38-42	D4-D8	OUT	**Digit selection signals.** Signal similar to D2.
43	D9	OUT	**Segment data signals.** Signal similar to D1.

Pin No.	Signal	I/O	Description
44	D10	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-1 line keys on key matrix is touched.
45	D11	OUT	Terminal not used.
46	D12	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-3 line keys on key matrix is touched.
47	D13	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-4 line keys on key matrix is touched.
48	R80	OUT	**Segment data signal.** Signal similar to D1. **Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-5 line keys on key matrix is touched.
49	R81	OUT	**Segment data signal.** Signal similar to D1. **Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-6 line keys on key matrix is touched.
50	R82	OUT	**Segment data signal.** Signal similar to D1. **Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-7 line keys on key matrix is touched.
51	R83	OUT	**Segment data signal.** Signal similar to D1. **Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to R20-R23 terminal while one of G-8 line keys on key matrix is touched.
52-55	R90-R93	OUT	**Segment data signal.** Signal similar to D1.
56-59	R10-R13	OUT	**Segment data signal.** Signal similar to D1.
60	R20	IN	**Signal coming from touch key.** When either one of G-9 line keys on key matrix is touched, a corresponding signal will be input into R20. When no key is touched, the signal is held at "L" level.
61	R21	IN	**Signal coming from touch key.** When either one of G-10 line keys on key matrix is touched, a corresponding signal will be input into R21. When no key is touched, the signal is held at "L" level.
62	R22	IN	**Signal coming from touch key.** When either one of G-11 line keys on key matrix is touched, a corresponding signal will be input into R22. When no key is touched, the signal is held at "L" level.
63	R23	IN	**Signal coming from touch key.** When either one of G-12 line keys on key matrix is touched, a corresponding signal will be input into R23. When no key is touched, the signal is held at "L" level.
64	Vdisp	IN	**Anode (segment) of Fluorescent Display illumination voltage: -26V.** Vp voltage of power source circuit input.

ABSOLUTE HUMIDITY SENSOR CIRCUIT

(1) Structure of Absolute Humidity Sensor

The absolute humidity sensor includes two thermistors as shown in the illustration. One thermistor is housed in the closed vessel filled with dry air while another in the open vessel. Each sensor is provided with the protective cover made of metal mesh to be protected from the external airflow.

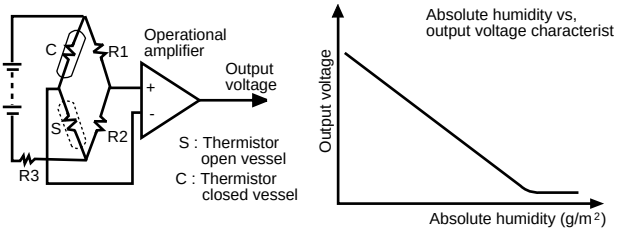


(2) Operational Principle of Absolute Humidity Sensor

The figure below shows the basic structure of an absolute humidity sensor. A bridge circuit is formed by two thermistors and two resistors (R1 and R2).

The output of the bridge circuit is to be amplified by the operational amplifier.

Each thermistor is supplied with a current to keep it heated at about 150˚C (302˚F), the resultant heat is dissipated in the air and if the two thermistors are placed in different humidity conditions they show different degrees of heat conductivity leading to a potential difference between them causing an output voltage from the bridge circuit, the intensity of which is increased as the absolute humidity of the air increases. Since the output is very minute, it is amplified by the operational amplifier.



(3) Detector Circuit of Absolute Humidity Sensor Circuit

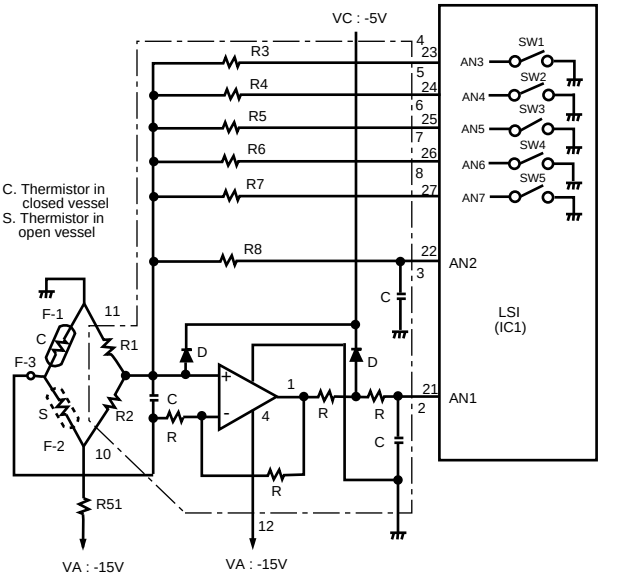
This detector circuit is used to detect the output voltage of the absolute humidity circuit to allow the LSI to control sensor cooking of the unit. When the unit is set in the sensor cooking mode, 16 seconds clearing cycle occurs than the detector circuit starts to function and the LSI observes the initial voltage available at its AN1 terminal.

With this voltage given, the switches SW1 to SW5 in the LSI are turned on in such a way as to change the resistance values in parallel with R1. Changing the resistance values results in that there is the same potential at both F-3 terminal of the absolute humidity sensor and AN2 terminal of the LSI. The voltage of AN1 terminal will indicate about -2.5V. This initial balancing is set up about 16 seconds after the unit is put in the Sensor Cooking mode. As the sensor cooking proceeds, the food is heated to generate moisture by which the resistance balance of the bridge circuit is deviated to increase the voltage available at AN1 terminal of the LSI.

Then the LSI observes that voltage at AN1 terminal and compares it with its initial value, and when the comparison rate reaches the preset value (fixed for each menu to be cooked), the LSI causes the unit to stop sensor cooking; thereafter, the unit goes in the next operation automatically.

When the LSI starts to detect the initial voltage at AN1 terminal 16 seconds after the unit has been put in the Sensor Cooking mode, if it is not possible to balance, of the bridge circuit due to disconnection of the absolute humidity sensor, ERROR will appear on the display and the cooking is stopped.

1) Absolute humidity sensor circuit



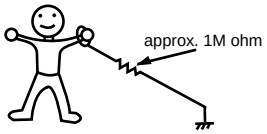
SERVICING

1. **Precautions for Handling Electronic Components**

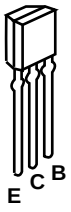
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc, and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

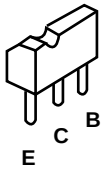
1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
DTA114YS
DTA143ESXHZ
DTB143ES
DTC114ES
DTD143ES
2SA933S



Transistor
2SB793

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper,and short both ends of the door sensing switch (on PWB) of the touch control panel,which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

1) Soldering iron: 30W
   (It is recommended to use a soldering iron with a grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: AVOID POSSIBLE EXPOSURE TO MICROWAVE ENERGY. PLEASE FOLLOW THE INSTRUCTIONS BELOW BEFORE OPERATING THE OVEN.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite" click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click' as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.
Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:
1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to "OVEN PARTS AND CABINET PARTS" AND "DOOR PARTS", when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case, procedure as follows.
1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back out about 3 cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.
6. Discharge the H.V. capacitor before carring out any further work.
7. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 6 from the basis of the 3D checks.

CAUTION: DISCHARGE THE HIGH VOLYAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

POWER TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect filament leads of transformer from the magnetron and capacitor.
3. Disconnect high voltage lead of capacitor from the transformer.
4. Disconnect wire leads from the transformer.
5. Remove two (2) screws holding the transformer to the base plate.

Re-install
1. Rest the transformer on the base plate with its primary terminals toward rear cabinet.
2. Insert the two edges of the transformer into two metal tabs of the base plate.
3. Make sure the transformer is mounted correctly to the corners underneath those tabs.
4. After re-installing the transformer, secure the transformer with two screws to the base plate.
5. Re-connect the wire leads (primary and high voltage) and high voltage lead to the transformer and filament leads of transformer to the magnetron and capacitor, referring to the "Pictorial Diagram".
6. Re-install the outer case and check that the oven is operating properly.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect filament lead of transformer from magnetron.
3. Disconnect high voltage wire lead from magnetron.
4. Remove two (2) screws holding the chassis support to the oven cavity face plate and the rear cabinet.
5. Remove one (1) screw holding the chassis support to the magnetron.
6. Carefully remove four (4) mounting screws hold the magnetron to waveguide, when removing the screws holding the magnetron to prevent it from falling.
7. Remove the magnetron from the unit with care so the magnetron tube should not hit by any metal object around the tube.
8. Remove one (1) screw holding the magnetron duct to the magnetron.
9. Remove one (1) screw holding the magnetron guide to the magnetron.
10. Now the magnetron is free.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

HIGH VOLTAGE RECTIFIER ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove one (1) screw holding the rectifier assembly to the capacitor holder.
3. Disconnect the rectifier assembly from the capacitor.
4. Disconnect the high voltage wire of the rectifier assembly from the power transformer.

CAUTION: WHEN REPLACING THE HIGH VOLTAGE RECTIFIER ASSEMBLY, THE GROUND SIDE TERMINAL MUST BE SECURED FIRMLY WITH A GROUNDING SCREW.

HIGH VOLTAGE CAPACITOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect filament lead of transformer from high voltage capacitor.
3. Disconnect high voltage wire lead from the high voltage capacitor.
4. Disconnect the high voltage wire of the rectifier assembly from the power transformer.
5. Remove one (1) screw holding the rectifier to the capacitor holder.
6. Remove one (1) screw holding the capacitor holder to base plate.
7. Remove the capacitor from the holder.

POSITIVE LOCK® CONNECTOR (NO-CASE TYPE) REMOVAL

Push the lever of positive lock® connector. Pull down on the positive lock® connector.

CAUTION: WHEN YOU CONNECTING THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, INSTALL THE POSITIVE LOCK® SO THAT THE LEVER FACES YOU

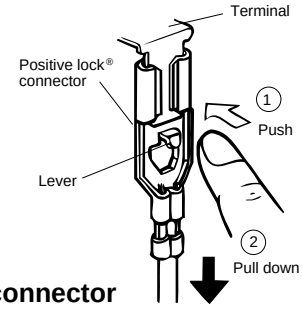


Figure C-1. Positive lock®connector

FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from the fan motor.
3. Release the main harness from the wire holder and thermal cut-out.
4. Release two snap bands of the thermistor harness from chassis support.
5. Remove three (3) screws holding the chassis support to the oven cavity front face plate, magnetron and rear cabinet.
6. Remove the chassis support.
7. Disconnect wire leads from the damper switch..
8. Remove two (2) screws holding the magnetron and fan duct to the waveguide..
9. Remove one (1) screw holding the fan duct to the oven cavity front face plate.
10. Release the main harness from the hole of the fan duct.
11. Release the thermistor harness from the hole of the fan duct.
12. Remove the fan duct assembly from the oven.
13. Remove one (1) screw holding the thermal cut-out mounting angle (with thermal cut-out) to the fan motor.
14. Remove the fan blade from the fan motor shaft according the following procedure.

1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

*** Make sure that any pieces do not enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.**

*** Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.**

*** Do not disfigure the bracket by touching with the pliers.**

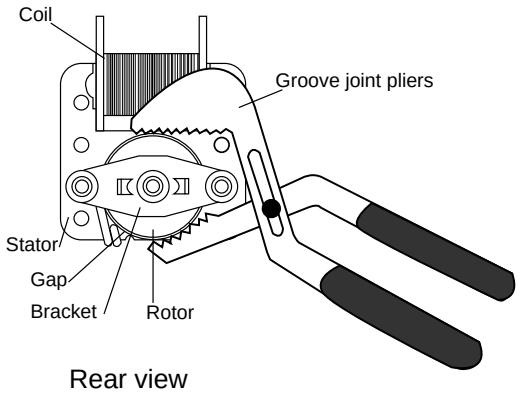
2) Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.

3) Now, the fan blade will be free.

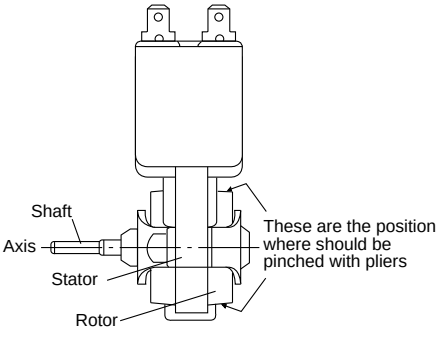
CAUTION:

*** Do not use this removed fan blade again because the hole (for shaft) of it may become bigger than a standard one.**

15. Remove the two(2) screws holding the fan motor to the fan duct.
16. Now, the fan motor is free.



Rear view



Side view

INSTALLATION

1. Re-install the thermal cut-out mounting angle (with thermal cut-out) to the fan motor with one (1) screw.
2. Install the fan motor to the fan duct with the two(2) screws.
3. Install the fan blade to the fan motor shaft according the following procedure.

1) Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

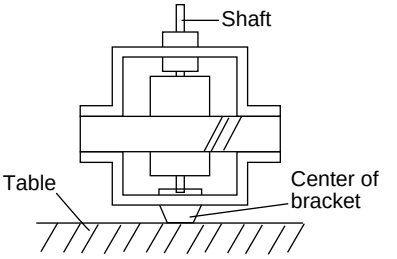
CAUTION:

*** Do not hit the fan blade strongly when installed because the bracket may be disfigured.**

*** Make sure that the fan blade rotates smooth after installation.**

*** Make sure that the axis of the shaft is not slanted.**

4. Reset the fan duct assembly to its place.
5. Install the fan duct to the waveguide with the two (2) screws.
6. Install the fan duct to the oven cavity front face plate with the one (1) screw.
7. Re-install the main harness and the thermistor harness to each hole of the fan duct.
8. Re-install the chassis support to the oven cavity front face plate, magnetron and the rear cabinet with the three (3) screws.
9. Re-install two snap bands of the thermistor harness to the chassis support.
10. Hold the main wire harness with the wire holder.
11. Re-connect the wire leads to the fan motor, thermal cut-out (FAN) and the damper motor, referring to the pictorial diagram.



TURNTABLE MOTOR REMOVAL

1. Disconnect the oven from power supply.
2. Remove the turntable tray, and the turntable support out of the oven cavity.
3. Turn the oven upside down and remove one (1) screw holding the turntable motor cover to the base plate and take off the turntable motor cover.
4. Disconnect wire lead from the turntable motor.
5. Remove the two (2) screws holding the turntable motor to the thermal cover (bottom).
6. Now, turntable motor is free.

DAMPER ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from damper motor and damper switch.
3. Remove one (1) oven side screw holding the damper duct to oven cavity
4. Release one (1) tab of the terminal cover right from the damper duct.
5. Remove the damper assembly from the oven.
6. Remove one (1) screw holding damper motor to damper duct.
7. Damper motor is free.
8. Bend the tab holding the damper switch to the damper duct..
9. Remove the damper switch from the damper duct..

CONVECTION DUCT ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from power supply cord terminals.
3. Remove one (1) screw holding the capacitor holder to the rear cabinet.
4. Remove eight (8) screws holding the rear cabinet the chassis support, oven cavity, thermal cover right, waveguide assembly and the base plate.
5. Disconnect wire leads from the thermistor, thermal cut-out, convection motor and heater element.

THERMISTOR REMOVAL

6. Remove two (2) screws holding the thermistor to the convection duct.

7 Now, the thermistor is free

THERMAL CUT-OUT (CONV.) REMOVAL

8. Remove two (2) screws holding the thermal cut-out to the convection motor mounting plate.
9. Now, the thermal cut-out is free.

CONVECTION HEATER REMOVAL

10. Remove three (3) oven side screws holding the convection duct to the oven cavity.
11. Remove six (6) screws holding the convection duct to the oven cavity.
12. Remove two (2) screws holding two heater mounting

plates to the convection duct.
13. Remove two (2) screws holding the convection heater to the convection duct.
14. Now, convection heater is free.

CONVECTION FAN AND MOTOR REMOVAL

15. Remove one (1) nut, spring washer and washer holding the convection fan to the convection motor shaft.
16. Now, convection fan is free.
17. Remove one (1) washer and pipe holding the reflection fan to convection motor shaft.
18. Remove two (2) screws holding the convection motor mounting plate to convection duct.
19. Remove the convection motor assembly, reflection fan and one (1) washer from the convection duct.
20. Remove the pin from the convection motor shaft.
21. Remove two (2) screws holding the convection motor to convection motor mounting plate.
22. Now, the convection motor is free.

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from lamp socket.
3. Pull out the lamp socket from the socket mounting plate.

CONTROL PANEL ASSEMBLY AND CONTROL UNIT REMOVAL

To remove the control panel, proceed as follows:
1. CARRY OUT 3D CHECKS.
2. Disconnect connector CN-A, CN-B and CN-F from the control unit.
3. Disconnect wire leads from the relays RY-1, RY-2 and RY-3.
4. Remove one (1) screw holding the control panel to the oven cavity front face plate.
5. Lift up and pull the control panel forward.

Replacement of individual components is as follows.
CONTROL UNIT AND KEY UNIT
6. Disconnect the connector CN-G from the control unit.
7. Remove the three (3) screws holding the control unit to the panel frame.
8. Lift up the control unit.
9. Now, the control unit and frame assembly are separated.

POWER SUPPLY CORD REPLACEMENT

Removal
1. CARRY OUT 3D CHECKS.
2. Disconnect the brown wire and blue wire of the power supply cord from the noise filter.
3. Remove the single (1) screw holding the cord anchorages to the oven cavity.
4. Remove the power supply cord from the oven.

Re-install
1. Insert the power supply cord into the cord anchorages.
2. Connect the brown wire and blue wire of the power supply cord into the terminals of noise filter, referring to pictorial diagram.
3. Tighten the single (1) screw holding the cord anchorages.
4. CARRY OUT 4D CHECKS.

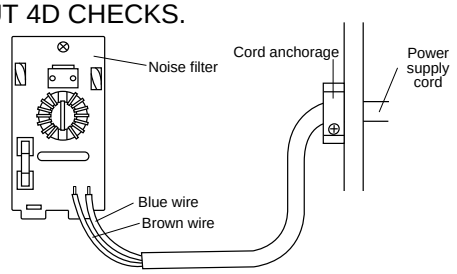


Figure C-2. Power supply cord

AH SENSOR ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the connector of AH sensor assembly from the control unit.
3. Remove the two (2) screws holding the AH sensor assembly and sensor cover together to the steam duct assembly.
4. Remove the control panel assembly, referring to "CONTROL PANEL ASSEMBLY AND CONTRO UNIT REMOVAL".
5. Release the one (1) snap band of AH sensor assembly from the hole of oven cavity front plate, using needle nose pliers.
6. Now, the AH sensor assembly is free.

1ST. LATCH SWITCH, 2ND. LATCH SWITCH,STOP SWITCH AND MONITOR SWITCH REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect wire leads from the switches.
3. Remove two (2) screws holding latch hook to oven flange.
4. Remove latch hook assembly from oven flange.
5. Push outward on the two (2) retaining tabs holding switch in place.
6. Switch is now free.
   At this time switch lever will be free, do not lose it.

Re-install
1. Re-install each switch lever and latch switch in its place. The 1st. latch /monitor switches are in the lower position and the 2nd. latch switch is in the upper position.
2. Re-connect wire leads to each switch.
   Refer to pictorial diagram.
3. Secure latch hook (with two (2) mounting screws) to oven flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure" and Adjustment procedure.

1ST. LATCH SWITCH, 2ND. LATCH SWITCH,STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the 1st. latch switch, 2nd. latch switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

1. Loosen the two (2) screws holding latch hook to the oven cavity front flange.
2. With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the 1st. latch switch and 2nd. latch switch are activated with the door closed.
3. Secure the screws with washers firmly.
4. Check the 2nd. latch switch operation. If the 2nd. latch switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, check the following.

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the door toward the oven face. Both results(play in the door) should be less than 0.5mm.
2. The 2nd. latch switch and stop switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

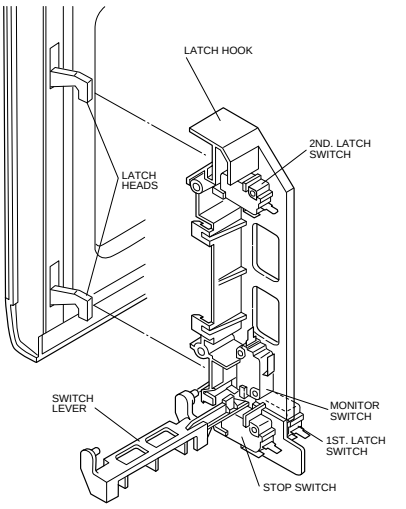


Figure C-3. Latch Switch Adjustments

DOOR REPLACEMENT AND ADJUSTMENT

REMOVAL

1. Disconnect oven from power supply and remove turntable tray and turntable support from oven cavity.
2. Remove the outer case cabinet, refer to "OUTER CASE CABINET REMOVAL".
3. Remove two (2) screws from upper oven hinge.
4. Push the open button and open the door slightly.
5. Release the upper oven hinge from upper door hinge pin by pulling down the door.
6. Release the lower door hinge pin from the lower oven hinge by pulling up the door.
7. Now the door assembly is free.

Note: When the individual parts are replaced, refer to "Door Disassembly".;

RE-INSTALL

1. On re-installing door, insert the lower door hinge pin into the lower oven hinge.
2. Insert the upper oven hinge to square opening in the upper right side of the oven cavity face plate. (from rear)
3. Insert the upper oven hinge into the upper door hinge pin.
4. Shut the door
5. Make sure the door is parallel with oven face lines (left and upper side lines) and door latch heads pass through latch holes correctly.
6. Secure two (2) screws holding the upper oven hinge to the top of the oven cavity.

Note: After any service to the door;

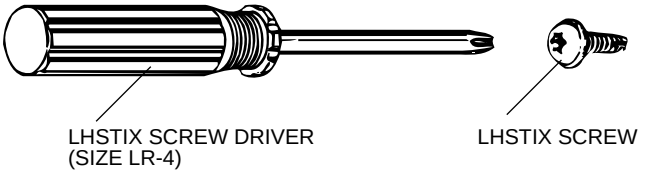
(A) Make sure that door sensing switch and secondary interlock switch are operating properly. (Refer to chapter "Test Procedures".).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

DOOR ADJUSTMENT

The door can be adjusted by keeping screws of each hinge loose. Lower oven hinge can be loosened with special screw driver (LHSTIX "LR-4").

Note: Lower oven hinge is secured by special (LH) screw. When securing or loosening screw, LHSTIX (LR-4) type screw driver should be used.



LHSTIX screw Driver and LHSTIX Screw

After adjustment, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.

2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves, indicate a leakage of microwave energy from oven cavity.

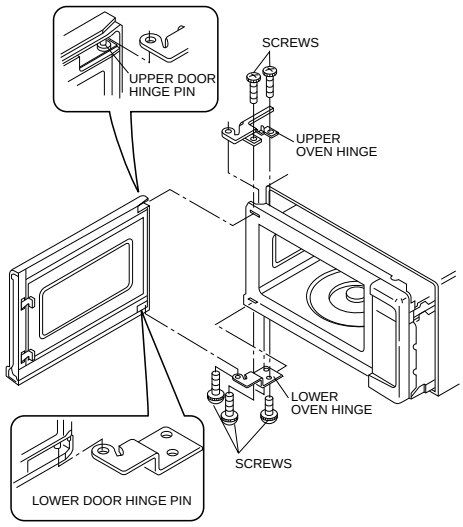


Figure C-4. Door Replacement and adjustment

DOOR DISASSEMBLY

Remove door assembly, refer to "Door Replacement".
Replacement of door components are as follows:

1. Place door assembly on a soft cloth with latches facing up.

Note: As the engaging part of choke cover and door panel are provided at 22 places, do not force any particular part.

2. Insert an putty knife (thickness of about 0.5mm) into the gap between the choke cover and corner portion of door panel as shown Figure C-5 to free engaging parts.
3. Lift up choke cover.
4. Now choke cover is free from door panel.
5. Remove six (6) screws holding the door frame to the gutter for choke cover.
6. Remove the door frame with pulling the upper door hinge pin.

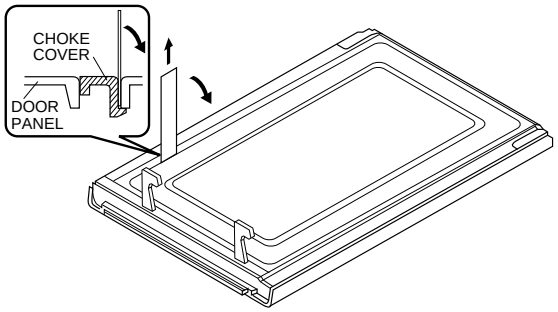


Figure C-5. Door Disassembly

SERVICE INFORMATION

Blown fuse due to defective asymmetric rectifier

There are many cases that the fuse is blown due to defective asymmetric rectifier. So, please follows below.

1. When use the current HV. Rectifier assembly with the Asymmetric Rectifier for service, please remove a part of the Asymmetric Rectifier by cut lead as shown in Figure A-1.
2. When the HV. Rectifier assembly with the Asymmetric Rectifier in the microwave oven was defect, please take steps indicated in below

PROCEDURE FOR SERVICE OF DEFECTIVE HV. RECTIFIER ASSEMBLY

1. When a part of the HV. Rectifier was defect, please replace the whole HV. Rectifier assembly.
2. When a part of the Asymmetric Rectifier was defect, please remove part of it by cut lead wires as shown Fig. A-1.
   2-1. After remove it, please check operation of the unit. If no power, please replace main fuse.
   2-2. Put water load in the oven and operate the unit. If no heat, please replace the magnetron.

Δ **Please keep more than 15.5mm of clearance distance from left of leads to other parts.**

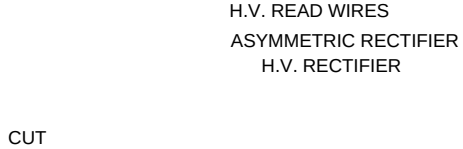


Figure A-1

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

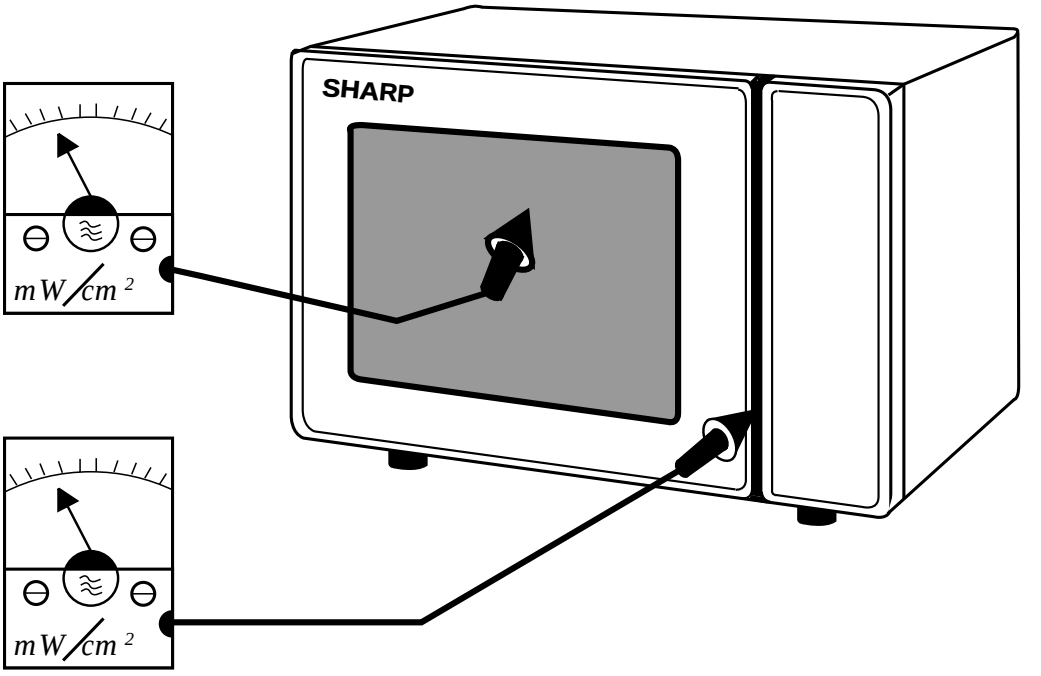
REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
   Important:
   Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.
   Recommended instruments are:
   NARDA 8100
   NARDA 8200
   HOLADAY HI 1500
   SIMPSON 380M
2. Place the oven tray into the oven cavity.
3. Place the load of 275 ± 15ml of water initially at 20 ± 5˚C in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster that 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED
2. CLOCK OR [:] APPEARS ON DISPLAY

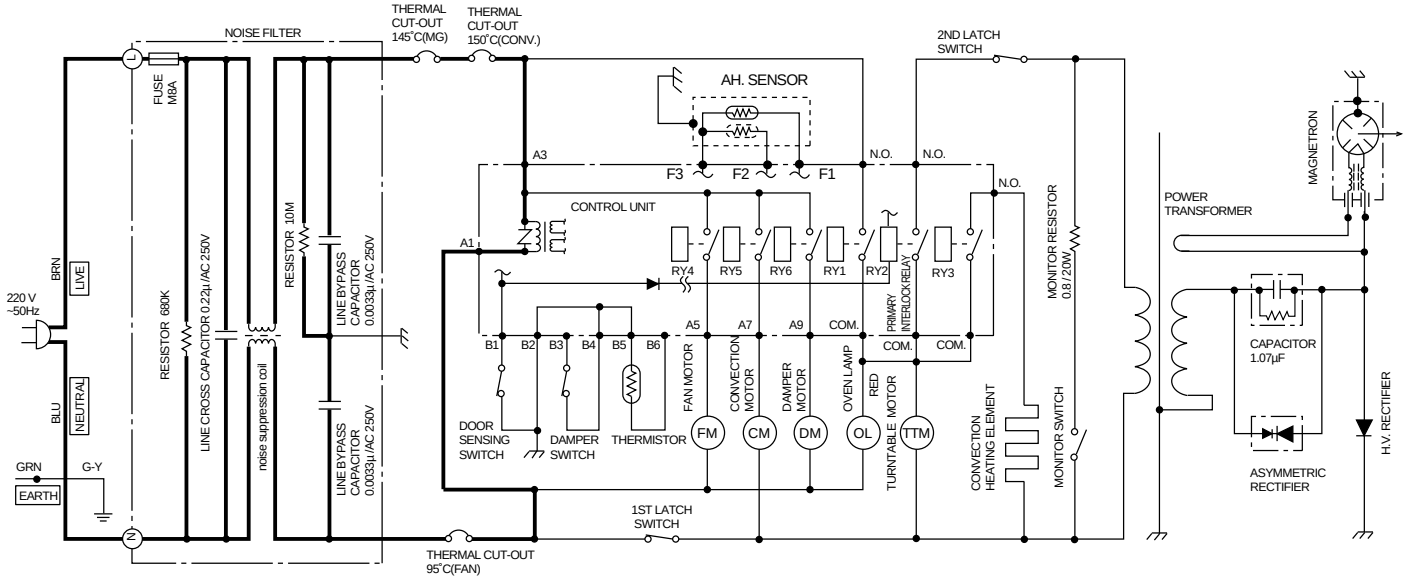


Figure O-1. Oven Schematic - Off Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED
2. COOKING TIME PROGRAMMED
3. VARIABLE COOKING CONTROL HIGH
4. START PAD TOUCHED

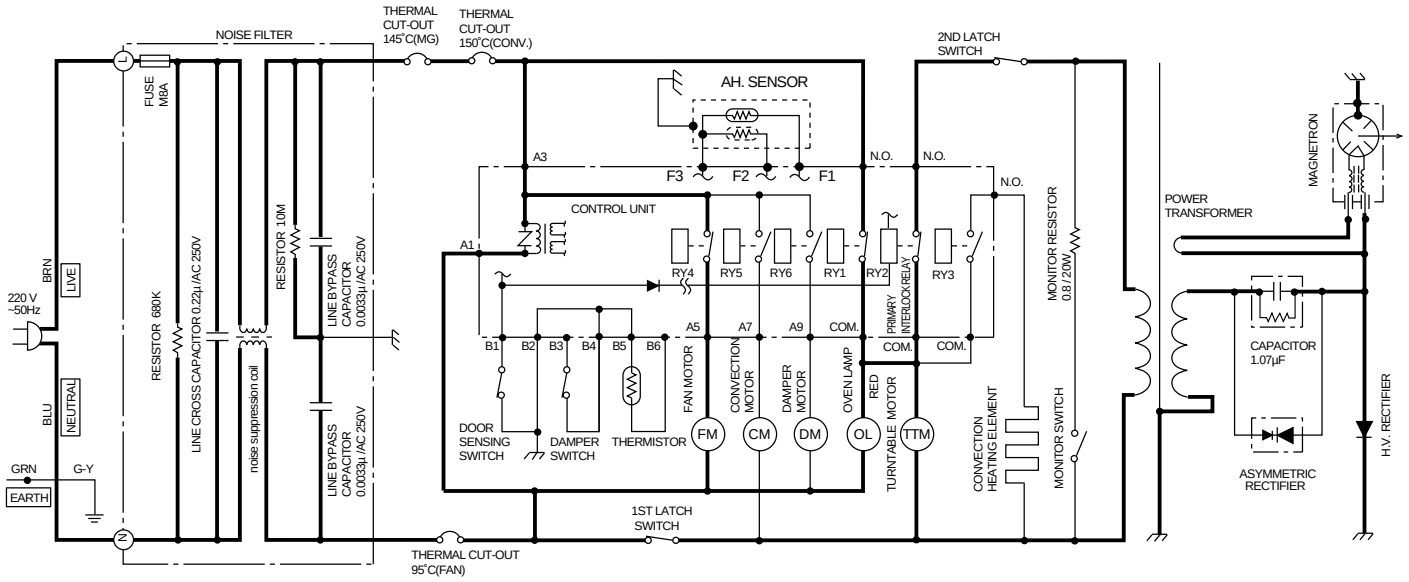


Figure O-2. Oven Schematic - Microwave Cooking Condition

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. "CONVEC" PAD TOUCHED.
4. DESIRED TEMPERATURE ENTERED.
5. START PAD TOUCHED.

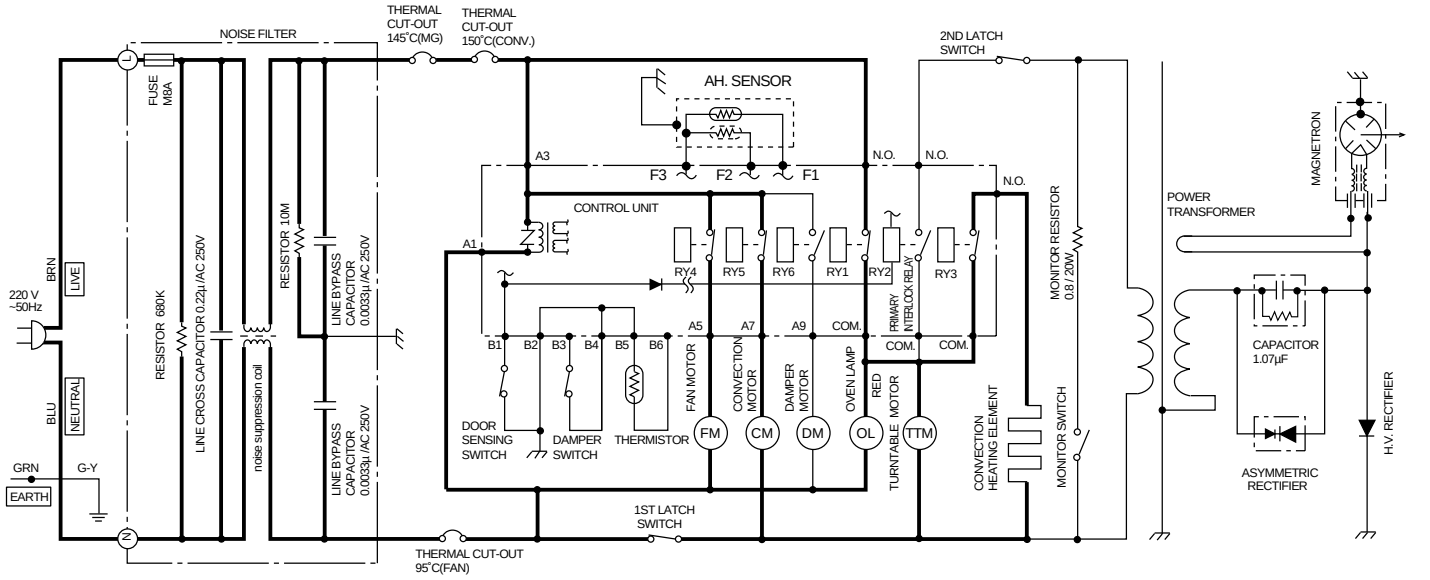


Figure O-3. Oven Schematic - Convection and Grill Cooking

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. LOW MIX OR HIGH MIX PAD TOUCHED.
4. START PAD TOUCHED.

NOTE: The relays RY2 and RY3 do not operate at the same time.

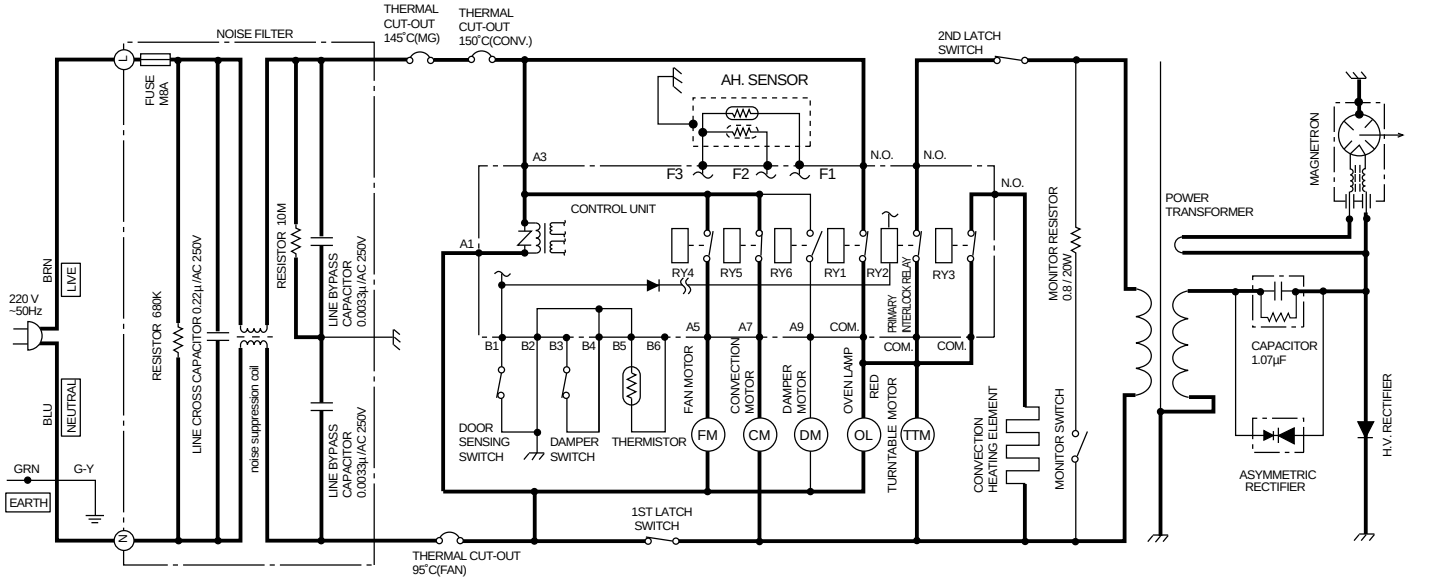


Figure O-4. Oven Schematic - Mix Cooking Condition

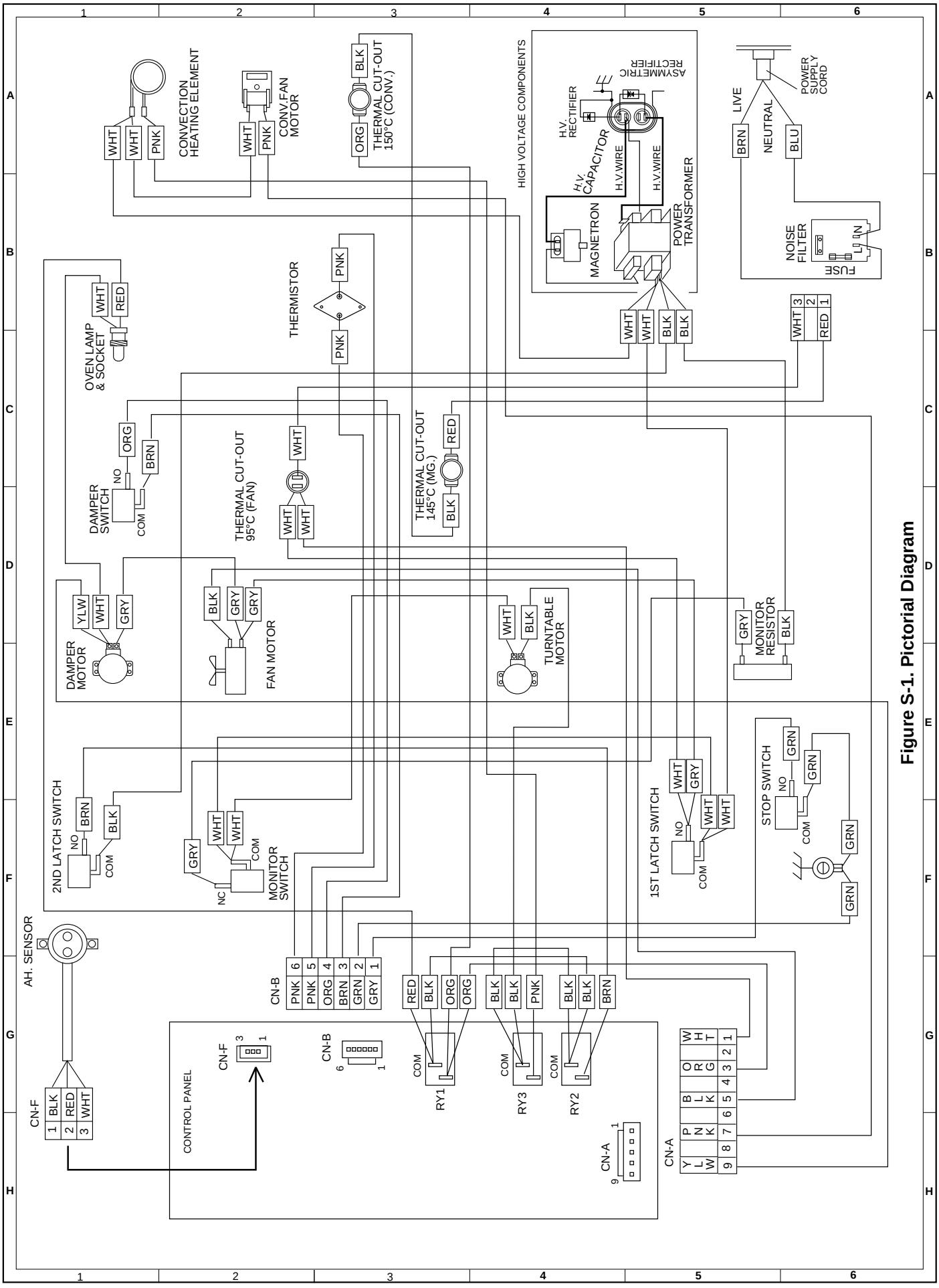


Figure S-1. Pictorial Diagram

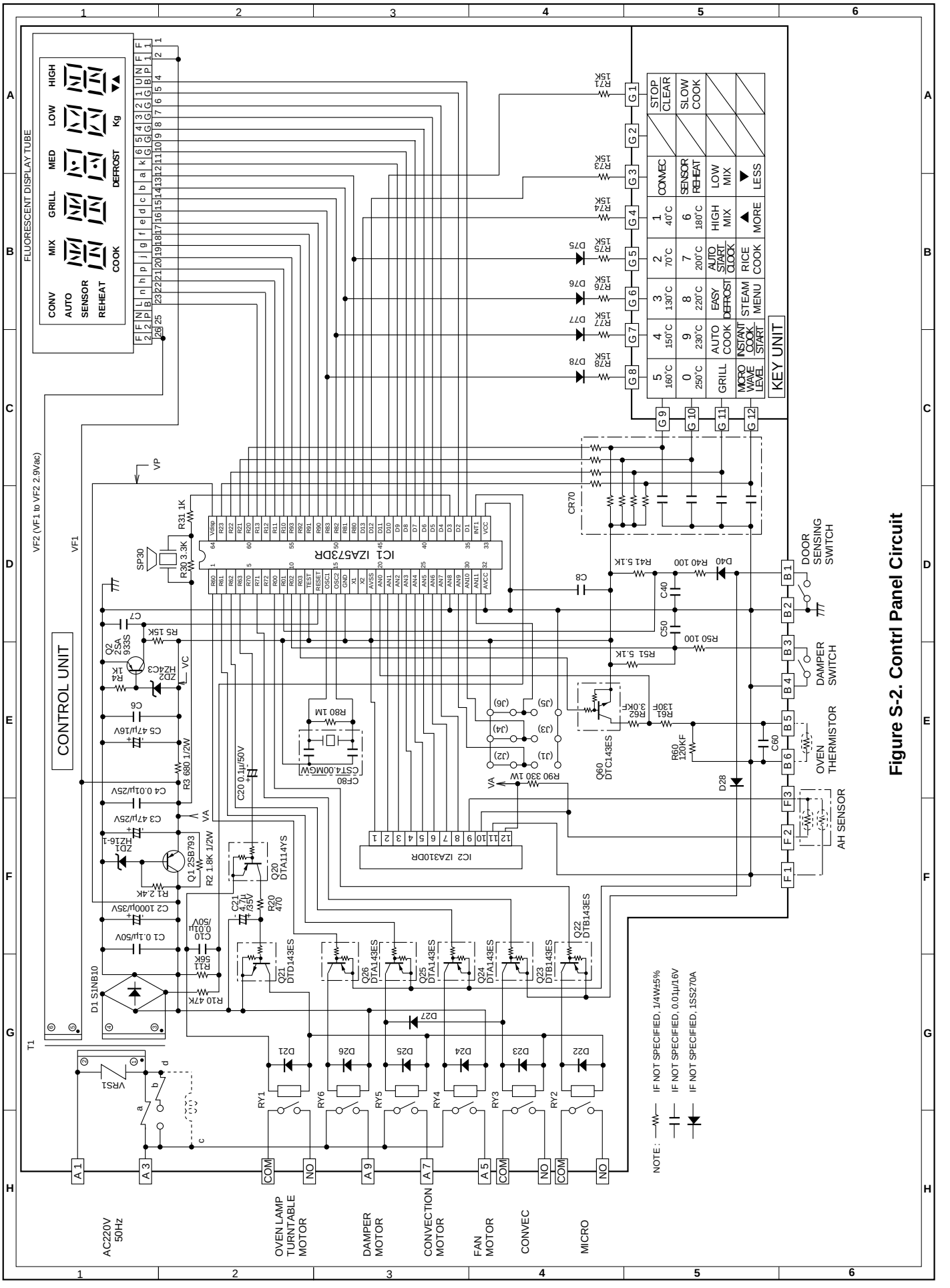


Figure S-2. Contrl Panel Circuit

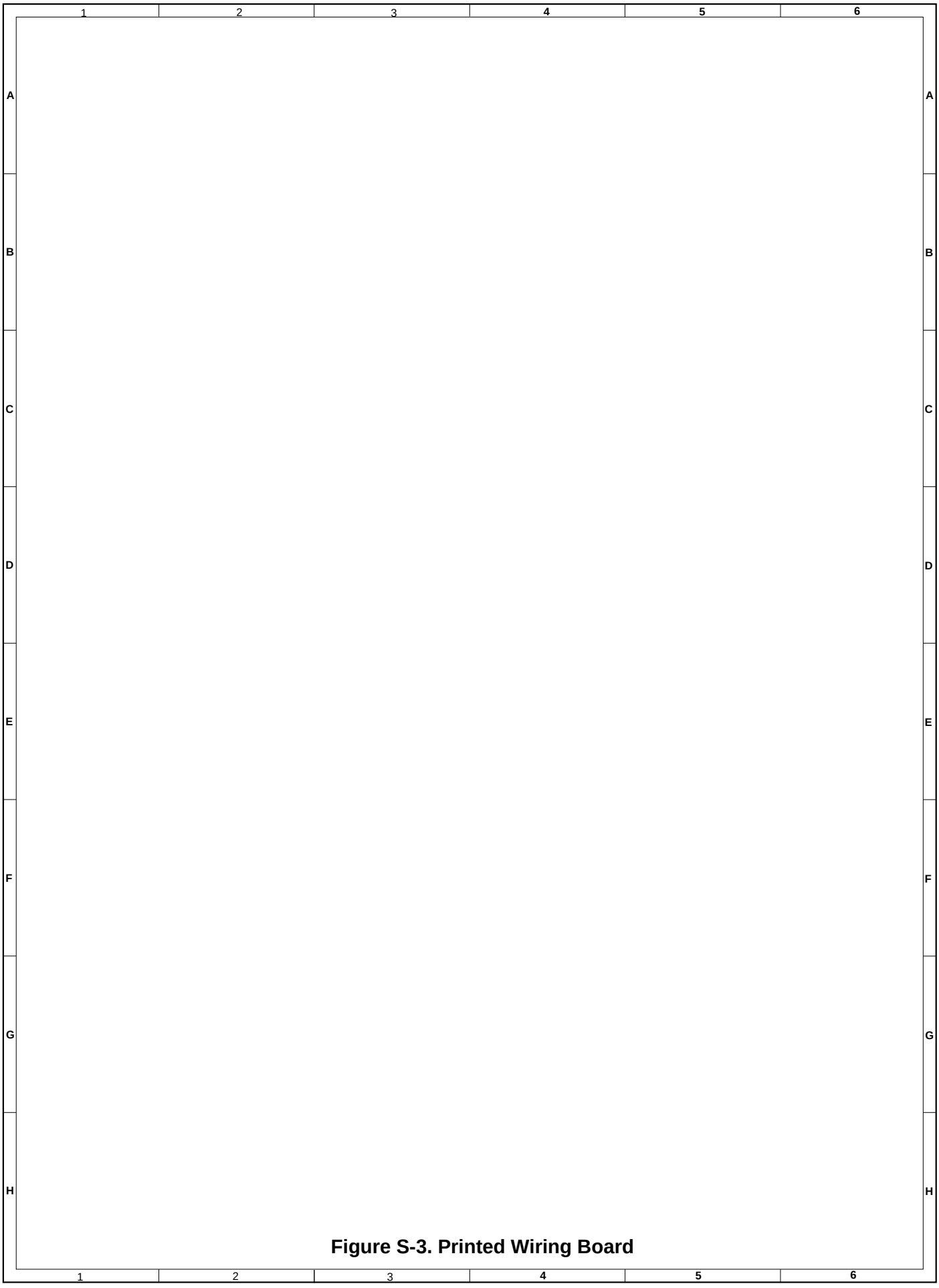


Figure S-3. Printed Wiring Board

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

	REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
			ELECTRIC PARTS		
	1- 1	FH-HZA007WRE0	Thermistor	1	AH
	1- 2	RHET-A156WRE0	Convection heater	1	BD
	1- 3	QACC-A042WRE0	Power supply cord	1	AR
	1- 4	RTHM-A085WRE0	Thermal cut-out 150˚C	1	AL
	1- 5	QSW-MA110WRE0	1st and 2nd latch switches, stop switch and damper switch	4	AK
	1- 6	QSW-MA111WRE0	Monitor switch	1	AK
	1- 7	RMOTDA191WRE0	Damper motor	1	AS
*	1- 8	RTRN-A419WRE0	Power transformer	1	BQ
	1- 9	RMOTDA189WRE0	Turntable motor	1	AT
	1-10	RR-WZA003WRE0	Monitor resistor 0.8 ohm 20w	1	AG
	1-11	RTHM-A080WRE0	Thermal cut-out 145˚C (MG)	1	AP
*	1-12	FH-DZA045WRK0	High voltage rectifier assembly	1	AW
*	1-13	RC-QZA172WRE0	High voltage capacitor	1	AY
	1-14	RMOTEA265WRE0	Fan motor	1	AZ
	1-15	RTHM-A072WRE0	Thermal cut-out 95˚C (FAN)	1	AM
Δ *	1-16	RV-MZA189WRE0	Magnetron	1	BM
	1-17	QFS-CA010WRE0	Fuse M8A	1	AE
	1-18	QSOCLA011WRE0	Oven lamp socket	1	AH
	1-19	RLMPTA028WRE0	Oven lamp	1	AK
	1-20	RMOTEA289WRE0	Convection motor	1	AZ
	1-21	FPWBFA284WRK0	Noise filter	1	AU
	1-22	FDTCTA156WRK0	AH sensor	1	AY
			CABINET PARTS		
	2- 1	FDAI-A177WRY0	Base plate	1	AT
	2- 2	GCOVHA324WRW0	Turntable motor cover	1	AG
	2- 3	GLEGPA019WRE0	Foot	4	AD
	2- 4	FCABDA022WRY0	Rear cabinet	1	AN
	2- 5	GCABUA395WRP0	Outer case cabinet	1	BD
			CONTROL PANEL PARTS		
	3- 1	CPWBFA583WRK0	Control unit	1	BR
	3- 1A	QCNCMA227DRE0	9-pin connector(A)	1	AC
	3- 1B	QCNCMA267DRE0	6-pin connector(B)	1	AC
	3- 1C	QCNCWA030DRE0	12-pin connector(G)	1	AF
	3- 1D	QCNCMA237DRE0	3-pin connector(F)	1	AD
	3- 1E	RV-KXA063DRE0	Fluorescent display tube	1	AZ
	C1	RC-KZA087DRE0	Capacitor 0.1µF 50V	1	AB
	C2	VCEAB31VW108M	Capacitor 1000µF 35V	1	AF
	C3	VCEAB31EW476M	Capacitor 47µF 25V	1	AA
	C4	VCKYB11EX103N	Capacitor 0.01µF 25V	1	AA
	C5	VCEAB31CW476M	Capacitor 47µF 16V	1	AA
	C6-8	VCKYD11CY103N	Capacitor 0.01µF 16V	3	AH
	C10	VCTYF31HF103Z	Capacitor 0.01µF 50V	1	AB
	C20	VCEAB31HW105M	Capacitor 1µF 50V	1	AA
	C21	VCEAB31VW475M	Capacitor 4.7µF 35V	1	AA
	C40	VCKYD11CY103N	Capacitor 0.01µF 16V	1	AH
	C50	VCKYD11CY103N	Capacitor 0.01µF 16V	1	AH
	C60	VCKYD11CY103N	Capacitor 0.01µF 16V	1	AH
	CF80	RCRS-A012DRE0	Ceramic resonator (CST4.00MGW)	1	AD
	CR70	RMPTEA011DRE0	CR array	1	AL
	D1	RSRCDA013DRE0	Diode bridge (S1NB10)	1	AG
	D21-28	VHD1SS270A/-1	Diode (1SS270ATA)	8	AA
	D40	VHD1SS270A/-1	Diode (1SS270ATA)	1	AA
	D75-78	VHD1SS270A/-1	Diode (1SS270ATA)	4	AA
	IC1	RH-IZA573DRE0	LSI	1	AW
	IC2	RH-IZA310DRE0	IC	1	AL
	Q1	VS2SB793///-4	Transistor (2SB793)	1	AC
	Q2	VS2SA933S//-3	Transistor (2SA933)	1	AB
	Q20	VSDTA114YS/-3	Transistor (DTA114YS)	1	AB
	Q21	VSDTD143ES/-3	Transistor (DTD143ES)	1	AC
	Q22-23	VSDTB143ES/-3	Transistor (DTB143ES)	2	AC
	Q24-26	VSDTA143ES/1B	Transistor (DTA143ESXHZ)	3	AB
	Q60	VSDTC114ES/-3	Transistor (DTC114ES)	1	AB
	R1	VRD-B12EF242J	Resistor 2.4k ohm 1/4W	1	AA
	R2	VRD-B12HF182J	Resistor 1.8k ohm 1/2W	1	AB
	R3	VRD-B12HF681J	Resistor 680 ohm 1/2W	1	AA
	R4	VRD-B12EF102J	Resistor 1.0k ohm 1/4W	1	AA
	R5	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
R10	VRD-B12EF473J	Resistor 47k ohm 1/4W	1	AA
R11	VRD-B12EF563J	Resistor 56k ohm 1/4W	1	AA
R20	VRD-B12EF471J	Resistor 470 ohm 1/4W	1	AA
R30	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	1	AA
R31	VRD-B12EF102J	Resistor 1.0k ohm 1/4W	1	AA
R40	VRD-B12EF101J	Resistor 100 ohm 1/4W	1	AA
R41	VRD-B12EF512J	Resistor 5.1k ohm 1/4W	1	AA
R50	VRD-B12EF101J	Resistor 100 ohm 1/4W	1	AA
R51	VRD-B12EF512J	Resistor 5.1k ohm 1/4W	1	AA
R60	VRN-B12EK124F	Resistor 120k ohm 1/4W	1	AA
R61	VRN-B12EK131F	Resistor 130 ohm 1/4W	1	AB
R62	VRN-B12EK302F	Resistor 3k ohm 1/4W	1	AB
R71	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R73-78	VRD-B12EF153J	Resistor 15k ohm 1/4W	6	AA
R80	VRD-B12EF105J	Resistor 1M ohm 1/4W	1	AA
R90	VRS-B13AA331J	Resistor 330 ohm 1W	1	AA
RY1-3	RRLY-A076DRE0	Relay (OMIF-S-124LM)	3	AK
RY4-6	RRLY-A080DRE0	Relay (OJ-SH-124LM)	3	AG
SP30	RALM-A014DRE0	Buzzer (PKM22EPT-THAI)	1	AG
T1	RTRNPA086DRE0	Transformer	1	AU
VRS1	RH-VZA032DRE0	Varistor (10G471K)	1	AE
ZD1	VHEHZ161///-1	Zener diode (HZ16-1)	1	AA
ZD2	VHEHZ4C3///-1	Zener diode (HZ4C-3)	1	AA
3- 2	FPNLCB082WRK0	Control panel frame with key unit	1	BC
3-2-1	FUNTKA594WRE0	Control panel frame with key unit	1	BA
3- 3	JBTN-A903WRF0	Open button	1	AE
3- 4	MSPRCA050WRE0	Open button spring	1	AB
3- 5	XEPSD30P10XS0	Screw : 3mm x 10mm	3	AA

OVEN PARTS

	4- 1	LANGQA392WRP0	Convection motor mounting plate	1	AH
	4- 2	LANGQA393WRP0	Heater mounting plate	2	AD
	4- 3	LANGTA306WRP0	Thermistor plate	1	AF
	4- 4	NFANMA045WRP0	Convection fan	1	AD
	4- 5	NFANMA046WRP0	Reflection fan	1	AD
	4- 6	PDUC-A556WRW0	Convection duct	1	AS
Δ	4- 7	MHNG-A342WRM0	Lower oven hinge	1	AK
	4- 8	PCUSGA404WRP0	Cushion	1	AA
	4- 9	PSKR-A273WRP0	Reflector A	1	AF
	4-10	PSKR-A274WRP0	Reflector B	1	AF
	4-11	PSKR-A275WRP0	Reflector C	1	AF
	4-12	PSLDHA116WRW0	Conv thermal cover	1	AM
Δ	4-13	PHOK-A085WRF0	Latch hook	1	AQ
	4-14	FDUC-A277WRK0	Steam duct assy	1	AH
	4-15	MCAMPA077WRF0	Damper cam	1	AE
	4-16	NSFTTA112WRE0	Damper shaft	1	AB
	4-17	PCUSGA390WRP0	Damper cushion	1	AE
	4-18	PDUC-A558WRP0	Damper duct	1	AQ
	4-19	PFTA-A025WRP0	Damper plate	1	AG
Δ	4-20	FOVN-A301WRY0	Oven cavity	1	BB
	4-21	PSLDHA118WRW0	Thermal cover right	1	AA
	4-22	NCPL-A046WRF0	Coupling	1	AM
	4-23	PCOVPA275WRE0	Waveguide cover	1	AR
	4-24	PCUSGA403WRP0	Cushion	1	AG
	4-25	PFPF-A176WRE0	Thermal insulation R	1	AP
	4-26	PPACGA131WRF0	TTM packing	1	AE
	4-27	PSLDHA117WRP0	Bottom thermal cover	1	AK
	4-28	LANGQA402WRP0	Socket mount plate	1	AK
Δ	4-29	MHNG-A336WRM0	Upper oven hinge	1	AK
	4-30	LANGQA343WRP0	Thermal cut-out mounting angle	1	AK
	4-31	NFANJA029WRE0	Fan blade	1	AL
	4-32	PDUC-A559WRW0	Fan duct	1	AP
	4-33	PFPF-A175WRE0	Thermal insulation B	1	AQ
	4-34	LANG-A048WRP0	Mg guide	1	AK
	4-35	LANGFA166WRP0	Chassis support	1	AK
	4-36	PCOVPA292WRF0	Sensor cover	1	AD
	4-37	PPIPFA006WRE0	Pipe	1	AD
	4-38	PGLSPA400WRE0	Light glass	1	AF
	4-39	MLEVPA194WRF0	Switch lever	1	AG
	4-40	LBNDKA095WRW0	HV capacitor band	1	AM
	4-41	PCUSUA409WRP0	Cushion	1	AA
	4-42	LSTPPA069WRF0	Cord anchorage (Upper)	1	AD

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

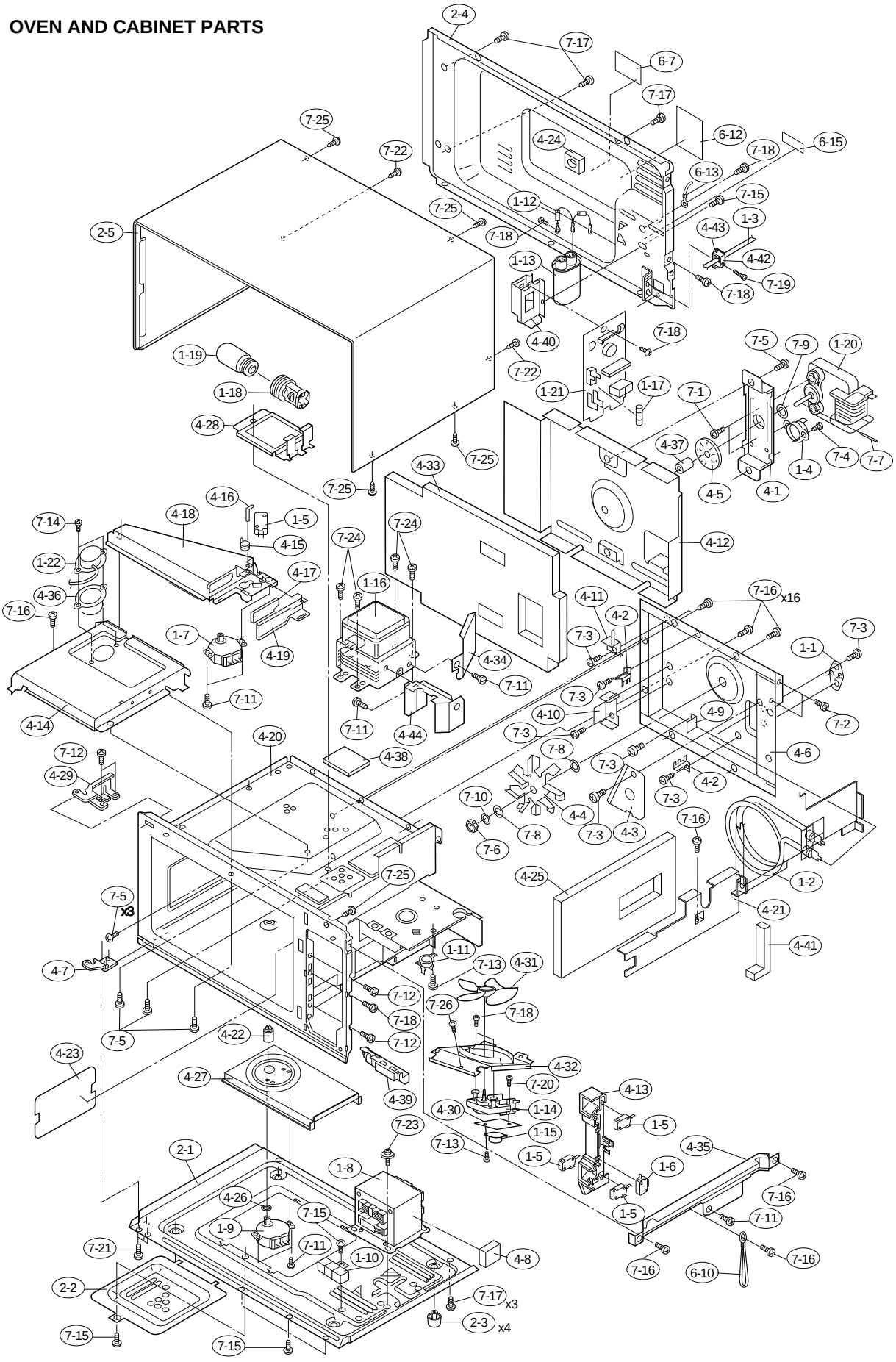
	REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
	4-43	LSTPPA070WRF0	Cord anchorage (Lower)	1	AC
	4-44	LANG-A047WRP0	Magnetron duct	1	AK
			DOOR PARTS		
Δ	5	CDORFA627WRK0	Door assembly	1	BP
Δ	5- 1	DDORFA659WRY0	Door panel assembly	1	AY
	5- 2	GCOVHA323WRF0	Choke cover	1	AK
	5- 3	FWAKPA070WRY0	Door frame and door glass assembly	1	BF
Δ	5- 4	LSTPPA129WRF0	Latch head	1	AG
	5- 5	MSPRTA081WRE0	Latch spring	1	AA
	5- 6	XEPSD30P08000	Screw : 3mm x 8mm	6	AA
			MISCELLANEOUS		
	6- 1	FAMI-A080WRM0	High rack	1	AQ
	6- 2	FAMI-A079WRM0	Low rack	1	AN
	6- 3	FROLPA071WRY0	Roller stay	1	AS
	6- 4	NTNT-A064WRH0	Turntable tray	1	AX
	6- 5	TCADCA512WRR0	Cook book in English	1	AS
	6- 5	TCADCA527WRR0	Cook book in Russian	1	AN
	6- 6	TINSEA626WRR0	Operation manual in Russian	1	AP
	6- 7	TSPCNC007WRR0	Rating label	1	AK
	6- 8	FW-VZB301WRE0	Thermistor harness	1	AS
*	6- 9	QW-QZA196WRE0	High voltage wire A	1	AK
	6-10	LBNDKA080WRE0	Wire holder B	1	AD
	6-11	LHLDWA011WRE0	Purse lock M	1	AB
	6-12	TCAUHA055WRR0	Caution label	1	AF
	6-13	TLABPA032WRR0	Earth label	1	AG
	6-14	FW-VZB308WRE0	Main harness	1	BA
	6-15	QW-VZA125WRE0	Earth wire	1	AK
			SCREWS,NUTS AND WASHERS		
	7- 1	XBTSD40P05000	Screw : 4mm x 5mm	2	AA
	7- 2	XBTWW40P06000	Screw : 4mm x 6 mm	2	AA
	7- 3	XCBWW30P06000	Screw : 3mm x 6mm	8	AA
	7- 4	XCPSD30P06000	Screw : 3mm x 6mm	2	AA
	7- 5	XCTWW40P08000	Screw : 4mm x 8mm	8	AB
	7- 6	XNEUW40-32000	Nut : 4mm x 3.2mm	1	AA
	7- 7	XPSSP20-20000	Pin	1	AA
	7- 8	XWHUW40-08000	Washer : 4mm x 0.8mm	2	AA
	7- 9	XWHUW50-08000	Washer : 5mm x 0.8mm	1	AA
	7-10	XWSUW40-10000	Washer : 4mm x 1.0mm	1	AA
	7-11	XFPSD40P06000	Screw : 4mm x 6mm	6	AA
	7-12	LX-CZ0052WRE0	Special screw	4	AA
	7-13	XFPSD30P06000	Screw : 3mm x 6mm	2	AA
	7-14	XFPSD30P08000	Screw : 3mm x 8mm	2	AA
	7-15	XHTSD40P08RV0	Screw : 4mm x 8mm	3	AA
	7-16	XOTSD40P08000	Screw : 4mm x 8mm	14	AA
	7-17	XOTSD40P12RV0	Screw : 4mm x 12mm	6	AA
	7-18	XFPSD40P08K00	Screw : 4mm x 8mm	6	AA
	7-19	XFTSD40P30000	Screw : 4mm x 30mm	1	AA
	7-20	XVPSD40P20000	Screw : 4mm x 20mm	1	AA
	7-21	LX-CZA029WRE0	LHSTIX screw (LHSTIX:LR-4)	3	AA
	7-22	LX-EZA047WRE0	Special screw	2	AC
	7-23	LX-EZA042WRE0	Special screw	2	AB
	7-24	LX-BZA041WRE0	Special screw	4	AA
	7-25	XOTSD40P12000	Screw : 4mm x 12mm	5	AA
	7-26	LX-CZ0056WRE0	Special screw	1	AA

HOW TO ORDER REPLACEMENT PARTS

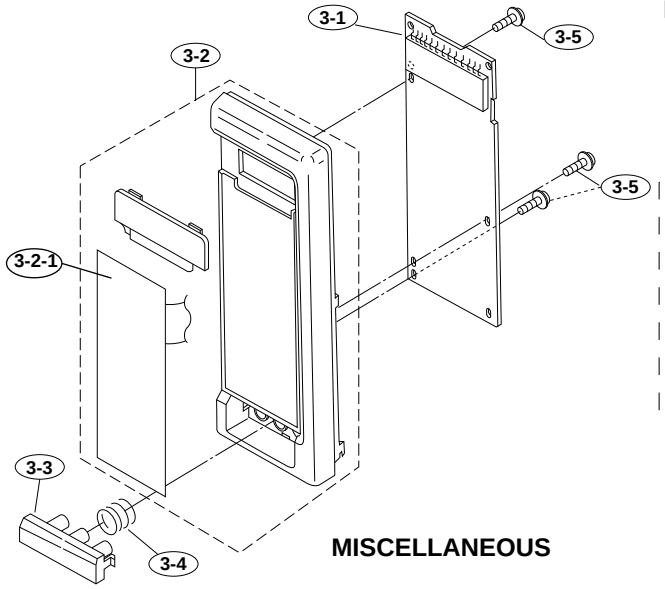
To have your order filled prompty and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

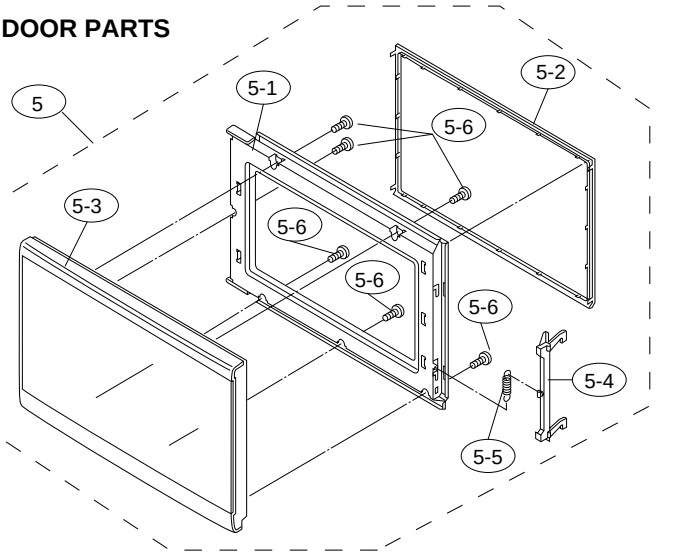
OVEN AND CABINET PARTS



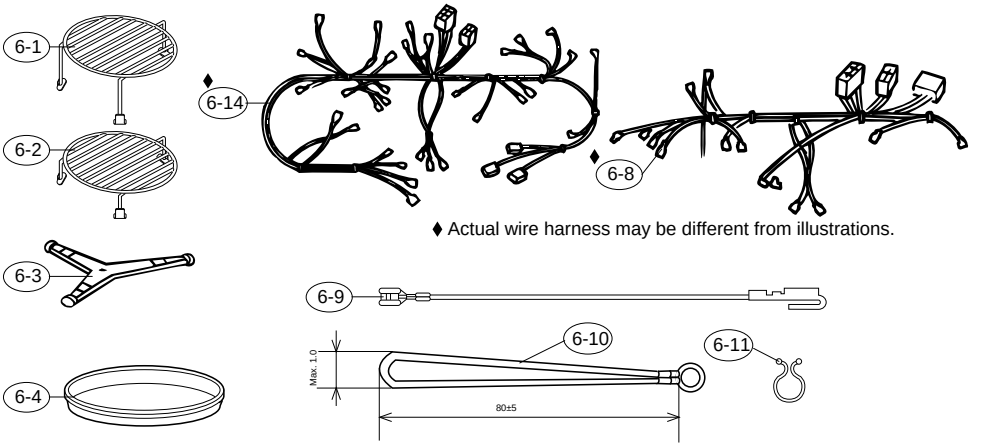
CONTROL PANEL PARTS



DOOR PARTS

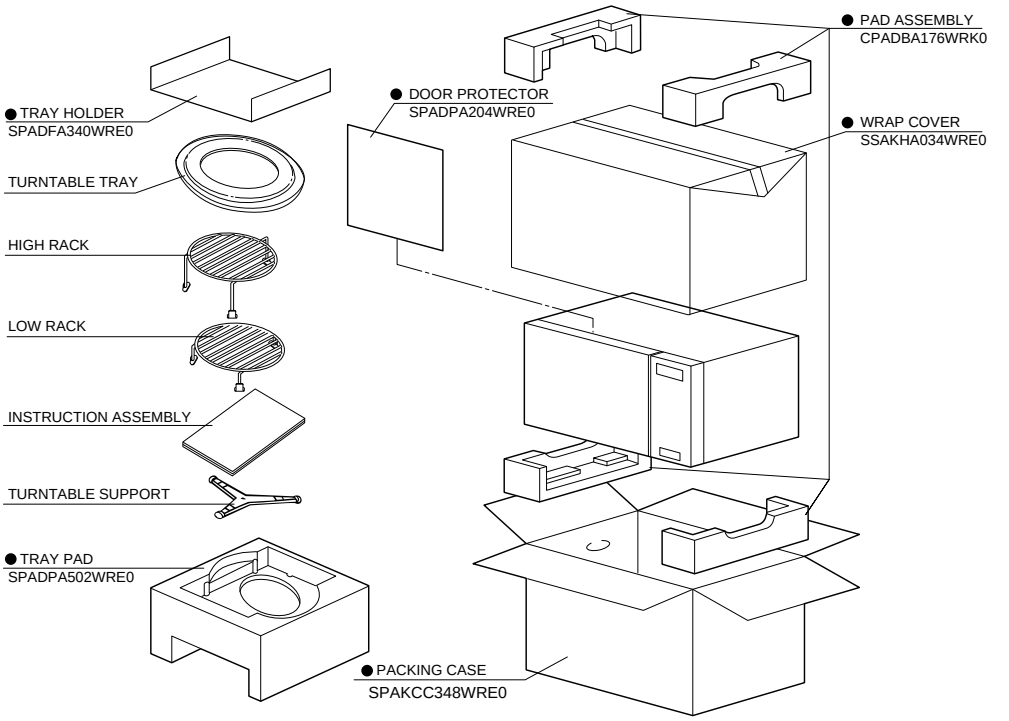


MISCELLANEOUS



♦ Actual wire harness may be different from illustrations.

PACKING AND ACCESSORIES



● **Not replaceable items.**

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